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1957

Volume 61 No. 2

ANNUAL MEETING, OCTOBER 13-18, 1957, CHICAGO

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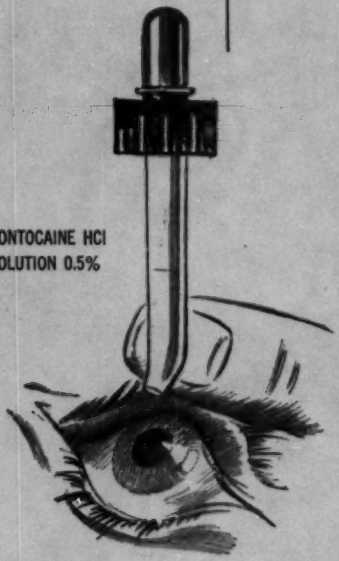

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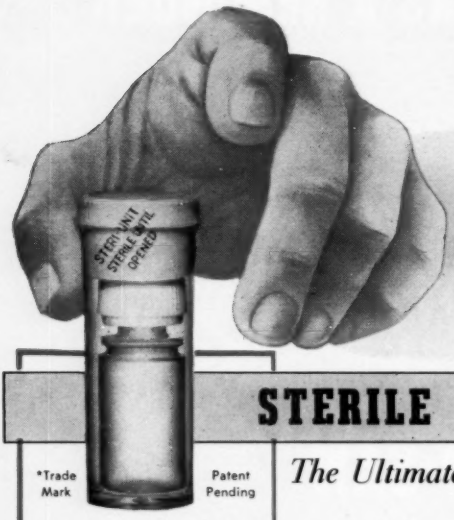

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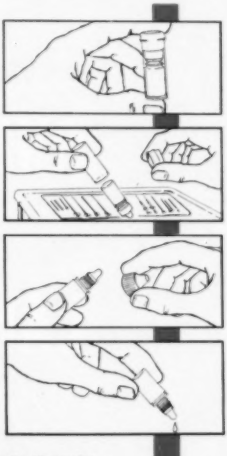

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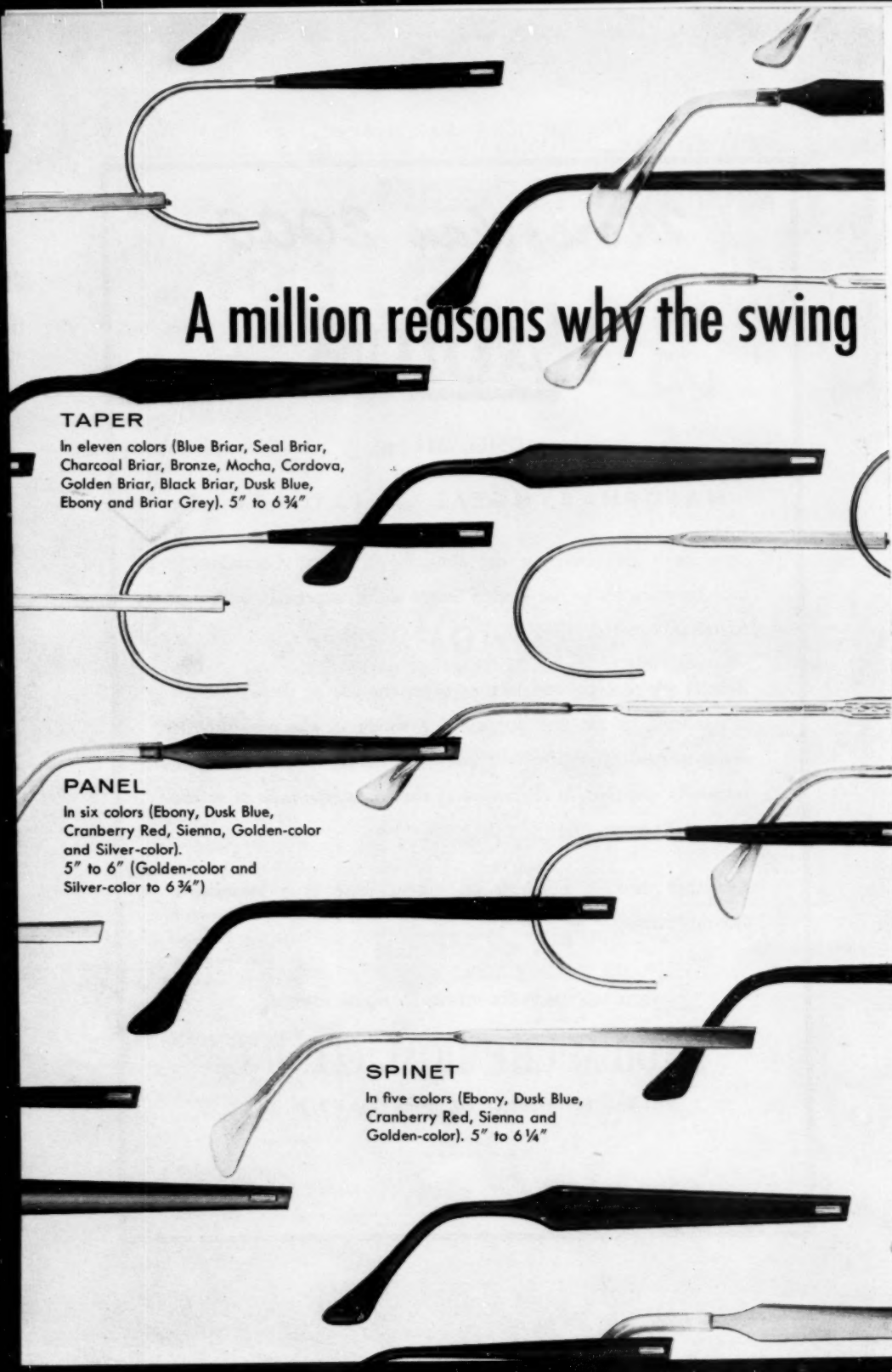

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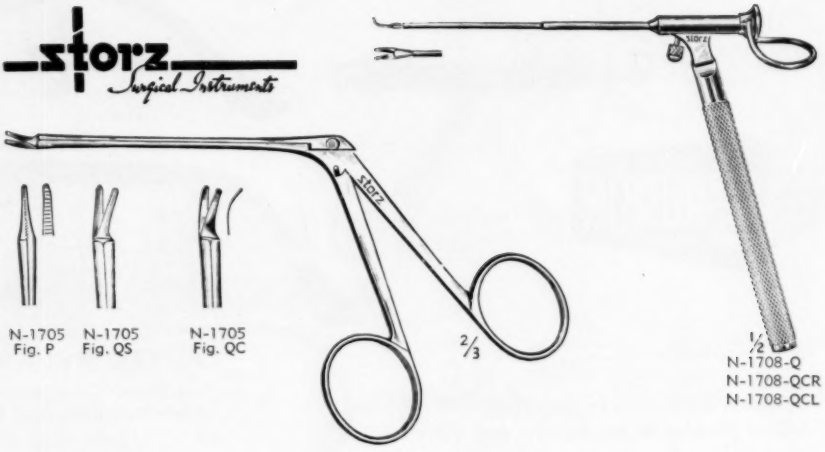

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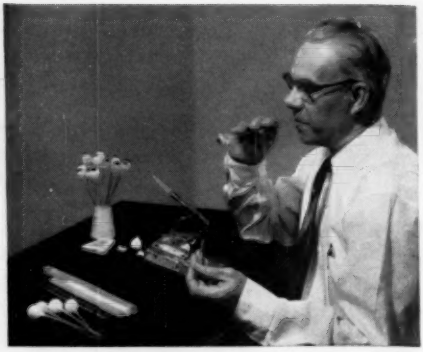

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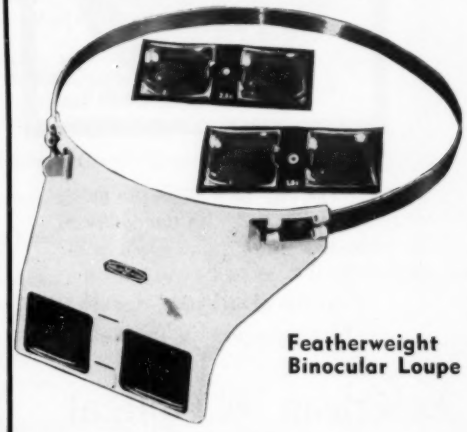

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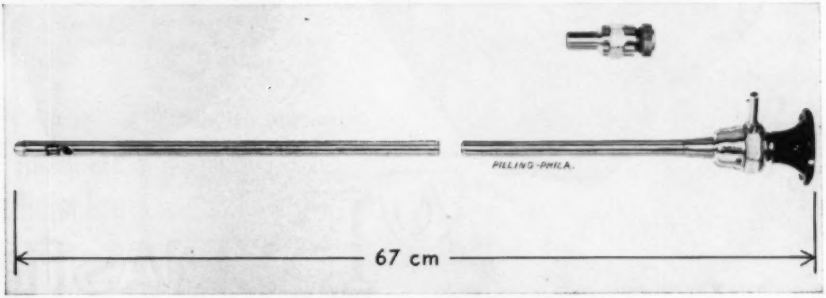

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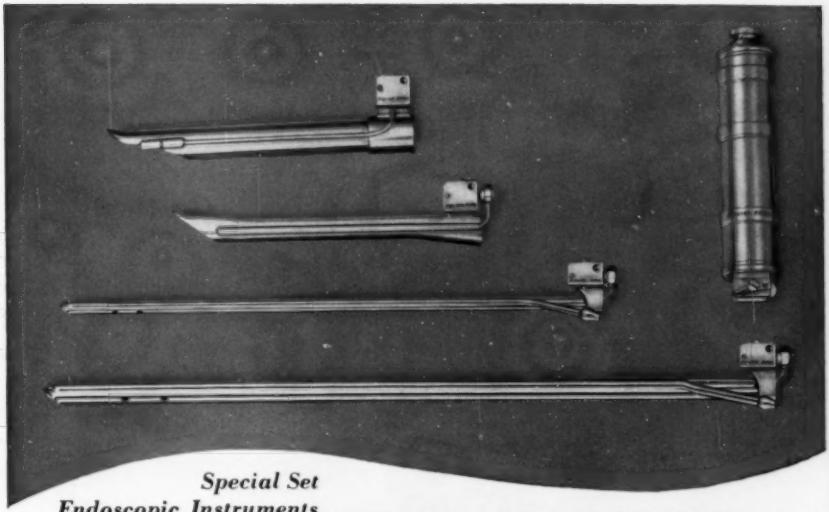

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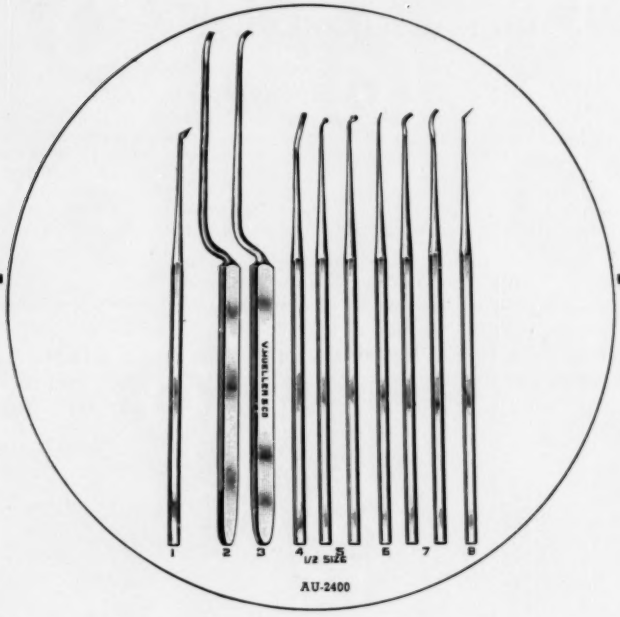

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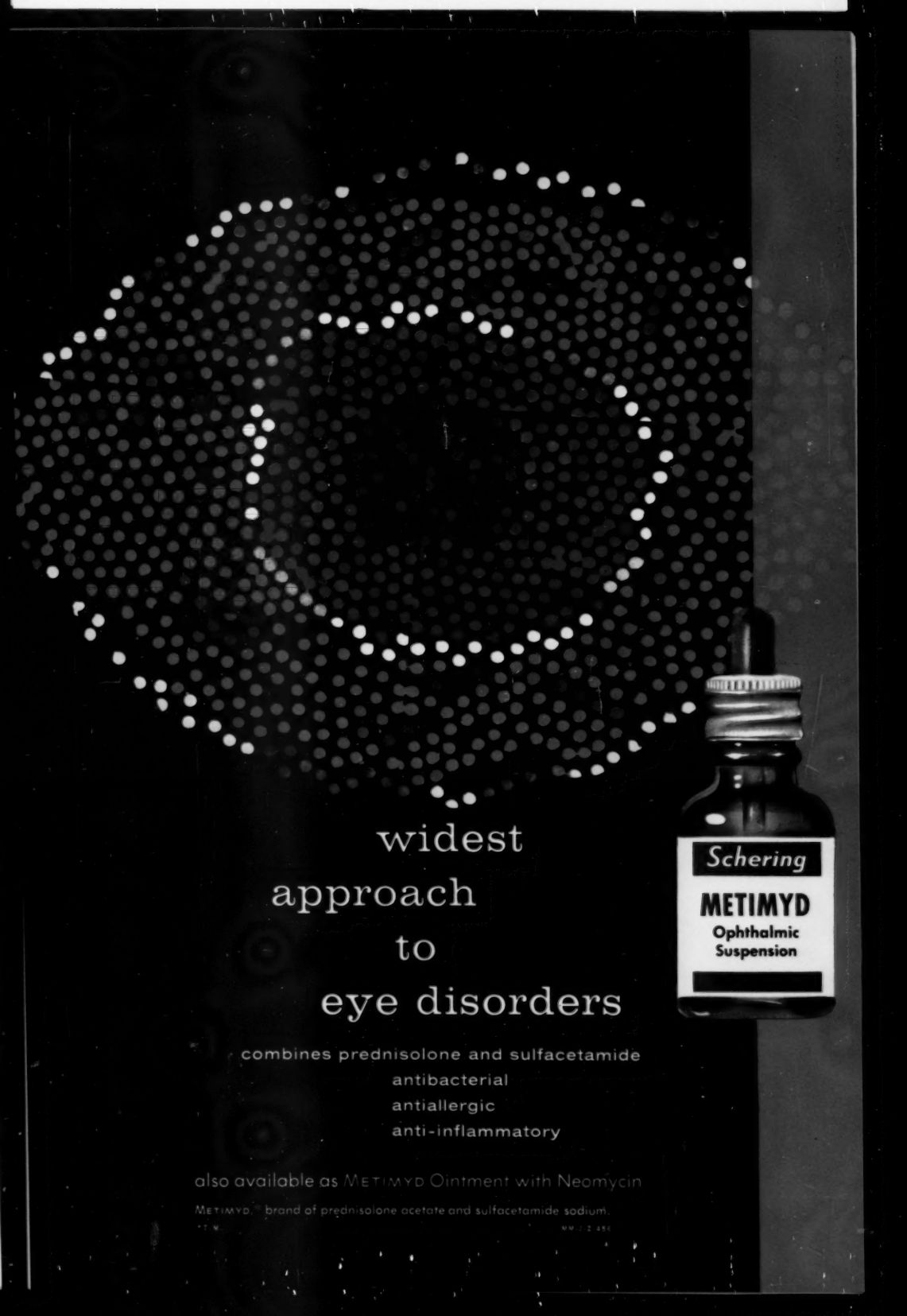
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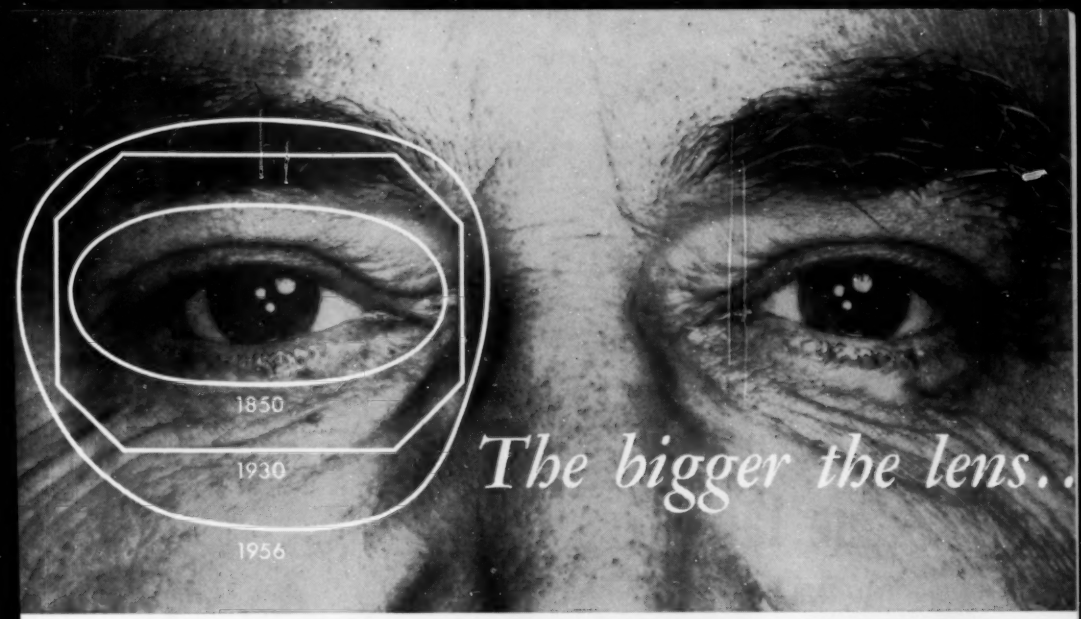

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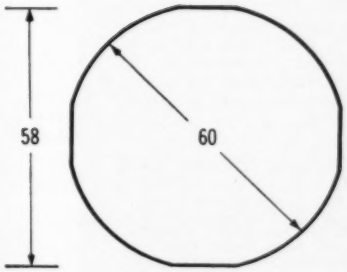

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1. Rasgorshek, R. H. and McIntire, W. C.: Am. J. Ophth. 40:34 (July) 1955. • 2. Ehrlich, L. H.: N. Y. State J. Med. 53:3015 (Dec. 15) 1953. • 3. Gettes, B. C.: A.M.A. Arch. Ophth. 51:467 (April) 1954. 4. Council on Pharmacy and Chemistry: J.A.M.A. 158:1523 (Aug. 27) 1955. • 5. Stolzer, I. H.: Am. J. Ophth. 36:110 (Jan.) 1953.

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IN the midst of this busier week of our busy lives, it is fitting that we pause now, for a brief hour, to give thought to an old friend who left us some fourteen years ago. Having known Bill Wherry intimately during the last twenty years of his life, I am grateful to the Academy in a very personal way for the invitation to deliver this lecture and to do him honor.

Those of you who worked with Bill remember him as a compelling character: studious, thoughtful and alert, and dedicated with all his heart and soul to the progress of the Academy and the American Board. His interest in the details of medical practice was overshadowed by a consuming occupation with its trends and tendencies: with teaching, examining and improving standards. He burned many a midnight kilowatt over his beloved charts and tables.

Were his spirit of a mind to descend from its bright cloud today and spend an hour with us, there is no doubt but that he would clamor first after these things: *Res Medica* of 1956. So it seems appropriate to me to desert the laboratory and the sickroom this year, and to discuss with you and Bill the special characteristics of contemporary medicine which engrossed him, as I see them today.

You will soon discover that this is no "recent advances" report. Medicine in this, as in other ages, is not all advance, nor is it all regression. It is a confounding jigsaw puzzle of progress, stasis, decay, and a few miracles.

I shall not presume to pass judgment but shall attempt only to fit the pieces together as accurately and realistically as they permit, leaving for you the fun of pondering the completed picture.

* * *

Never since the world began has Medicine been so much the pocket-piece of the young mother, the cancerphobe, the politician, the professional promoter, and the stockbroker as it is today. Unless the medical man promptly increases his stature, and that in a big way, he will soon become merely the Maypole around which the laity is gaily dancing, and he will inevitably end up finding himself completely bound around with its gaudy ribbons.

Pursuing, then, the Wherry method, let us stand off a piece and try to decide just what it is that characterizes this decade. Is it gay? or mauve? or roaring? or atomic? — Or what is it? Probably no era was ever able, during its existence, to pick its own proper epithet. The best we can do here is to set down the facts and let future generations put a tag on them. We can observe, and record, and take our history, and go into conference.

If one were to stop a hundred doctors out in the lobby and ask them how Medicine got the way it is today, most of them

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would quickly reply, "Sulfonamides, vaccines, and antibiotics." How right they would be, I leave to you. I doubt that more than a very few would add those six other cardinal etiological factors:

War
Taxes
The law of supply and demand
Paternalistic trends in government
The high cost of pharmaceutical processes
The daily press

The six are so closely inter-related as to make the task of separating them difficult. I will try.

* * *

The last twenty years have witnessed a complete change of scene in doctors' offices—what remains of them—and in sickrooms—what remains of *them.*

The doctor-patient relationship has become more tenuous. The doctor's daily schedule has changed. So has his attitude toward prescriptions, laboratory tests, operations, house calls, office procedures, hours, vacations, fees, and publicity. The disruptions of war lasted so long that many younger men are not even clearly aware of the size and importance of those changes, good and bad.

As to war, Pearl Harbor caught us unready. Suddenly and frantically everything we had was poured into the hopper of hasty preparedness, including our young medical men. For several years, more than a medical school generation, graduates, with scarcely time to read their diplomas, dashed for the nearest transport, hesitating only long enough to get married by the way, and plunged headlong into field medicine.

Field medicine in World War II was incomparably better dressed than her grandmother in World War I, but she was still field medicine, with the emphasis on adaptability and ingenuity, which was all to the good; and on mass tactics, quick turnover and general oversimplification, which was not so good and which, as training for budding private practitioners, was a far cry from the preceptorships their fathers had enjoyed. When his patient got out of hand, the oldster knew pretty much where to look for trouble, because he had often visited the sick one in the heart of his family or at least had grown up with him, medically. The field-trained youngster in the same fix met the problem in the only way he knew: he rang for room service in the shape of a psychiatrist or sent the whole bundle back to the base or to the laboratory. In his formative years, the simple doctor-patient amenities were left out. This made for self-confidence and initiative, but it also accounted for a good deal of the brashness and fumbling so characteristic of the self-taught.

* * *

By the end of the turmoil, good years had gone by and something else had come into the picture: little mouths to feed, big rents to pay, and, with a capital T, Taxes.

Taxes affected him and the rest of the medical world in two different ways: on the one hand, his own went up and had to be paid; on the other, the excess profits tax and related contrivances put an end to most private endowments. He finished his graduate training at the expense of you and me, which was completely what he had coming to him, but his mind was not in it. The first G. I. graduate courses after the war were heartbreaking; with one cerebral hemisphere on the recent horrors and the other on feeding a newly discovered family, much of the teaching settled in the cerebellum as a kind of conditioned reflex. These men still tell you that it took years of application and self-discipline to catch up.

* * *

What came to the rescue of the young doctor returned from service, was the

law of supply and demand. The current short supply of doctors kept his stomach from growling, but it left a dirty smudge on the complexion of his doctor-patient relationships which only the rebound of that same law will eventually wash away.

The shortage of medical men, which still persists, permitted the young doctors to establish themselves in practice overnight. In a surge of misplaced sympathy I approached one of my young friends, only a month out of the medical corps, with an invitation to take over some of my work but was turned down on the grounds that he was too busy with his own practice. It was true; he was!

The experience of "building up a practice" has disappeared. With a ready-made clientele sprung full-panoplied from the brow of—shall we say Mars? it is difficult for even the doctor himself to find out whether he is much good or not. Patients have become less discriminating, if more demanding, but so have doctors; and since all doctors have been prosperous for a decade, there is nothing but the innate idealism of some individuals to keep Medicine on her really high pedestal.

The war left its mark on the hospitals, too. Even top-flight institutions were compelled to resort to medical student externs, scarce far enough advanced to utilize the teaching material at hand, and certainly incapable of treating the sick. Hemorrhages went undetected, bowels unmoved. Residencies in the best teaching hospitals went begging after the war, while applicants flocked to third-rate places with better pay. Teachers and facilities which had taken years to build up died on the vine. Some of them died for keeps.

* * *

The busy, busy doctor now has two inexhaustible allies, which materialized like genii out of a bottle while he was away at the wars. Their names, while not exactly oriental, are high-sounding enough to work magic: sulfonamides and antibiotics.

Unquestionably the greatest single advance in medical therapy in the fifteen years since Wherry lived—indeed, in the sixty years since Pasteur lived—is the antibiotic in its various forms. The story of its accidental discovery, the "latent" period before its full significance was realized, the period of waiting while it was reserved for military needs, and its final emergence as the modern miracle —all this is familiar ground. What concerns us here is not so much the effect of antibiotics on disease germs as on doctors and patients and the traffic between the two.

The birth of penicillin was highly dramatized by its effect on war casualties, an effect further heightened by its inaccessibility and great price. The public was aroused, as it has been, impartially, by every medical novelty from Mesmer's needles to ionization. The man in the street quickly decided that lethal infection was a thing of the past; and right behind him came his physician, flabbergasted by the clinical miracles on every side. The old strategy against sepsis collapsed. A new one arose in its place, and doctors, being human (some of them even more human than others), allowed themselves to be inoculated with the uncritical faith of the masses in the miracle. As its cost came down, the antibiotic was apt to replace the careful diagnosis. On the whole, the race was doubtless away ahead, but the vigilance of the medical mind had relaxed. All this happened years ago.

How about 1956? As in the case of the airplane, the radio and the cyclotron, yesterday's miracle is today's commonplace, and the two mighty A's, aspirin and antibiotic, are now side by side on the shelf, and in the mind. The latter still requires a prescription, and a little glam-

our still clings to it. The practitioner, when he finds himself beyond his depth, still refers his patient to the specialist; but how often can he resist just giving him a dose of penicillin first, as a parting shot?

* * *

In 1880, sixty-four persons per million population graduated from medical schools. By last year this figure had dropped to 42. In the same period, the medical schools of the country had receded from one for each million population to one for each two million. The principal adjustment in this proportion occurred during the first decade of the century with the weeding out of inadequate and unethical teaching institutions and the general clean-up in medical standards.

It is edifying to report that these standards, so stoutly defended by the medical examining boards and by Bill Wherry, who gave much of his life to the task, are still being guarded by the forces which he helped to set in motion.

The effect of governmental and economical influences (the two go hand in hand) upon medical schools requires some mention. Just as there is a shortage of medical men, there is also a shortage of medical schools and of money in the schools. There are at present, in this country, 75 four-year medical schools with an enrollment of 28,583 students. Approximately 7000 were graduated in 1955.

Forty-two schools are privately owned, 37 state owned, and three municipally owned. Nearly half (48.7 per cent) of the total operating expense in 1955-56 was met from public funds.

Medical teaching, on the whole, is on a high plane. Graduate teaching is adequate in most places, brilliant in others. As in almost every other phase of cultural activity, towering individuals are becoming fewer and fewer; mass methods are the order of the day. Text books are written by groups instead of Titans.

While somewhat above the level of wages in other university departments, the income of medical teachers is not high. To ameliorate this situation a little, the Commonwealth Fund, within the year, announced unrestricted grants of $7,150,000 to ten university medical schools in addition to $2,000,000 already allocated for the year. The whole picture of professors' salaries was thrown into prominent relief last December by grants to colleges and hospitals across the country totalling a half billion dollars, the gift of the Ford Foundation.

Full-time professors, on the whole, are at a disadvantage, compared to their intellectual equals in business or in private practice. In most institutions there is a working arrangement which permits part-time practice to enable capable teachers to make an adequate living. Without this, the run of professors can easily become substandard.

A meager stipend is apt to attract only a few dedicated persons (with or without private purses) or, more often, young, untried people whose scale of living still fits into the available salary. The inexperienced youth, trying hard to fill a chair before his feet can reach the floor, for the nonce, may substitute loftiness for ability and, through insecurity, avoid seeking help from the elders in his department, only to discover one day that the nonce has passed, the opportunity for greatness is gone, and only loftiness remains. Nothing is left for him but the ivory tower into which he climbs until Time and a kindly Emeritus blow him away, to the great relief of the Department.

I have often studied the curricula of medical schools and marveled at the distribution of emphasis. I can only ex-

plain the remoteness of some of them from the demands of medical practice in terms of my Aunt Ella (long since gone to her reward and, incidentally, leaving behind a pair of very instructive otosclerotic temporal bones).

Aunt Ella was a distinguished pianist. She scorned ragtime, which seemed to me a pity. She felt it was too easy; she could make it up, yards of it, any time she felt like it, and proceeded to demonstrate. The result was certainly easy; it was certainly terrible; but, primarily, it was certainly not ragtime. With all her musical erudition, she simply didn't know about ragtime.

It's much the same thing when a curriculum, designated to prepare men to practice medicine, is concocted in large measure by chemists, biologists, and anatomists, who not only never practiced medicine themselves but often never even studied it.

Much of this applies also to the autonomy of special departments in hospitals and schools. Special cases require special solutions, and in this year 1956 there is still room for improvement.

Keeping the surgical specialties subservient to the general Department of Surgery and dependent upon the head of that department for time, space, funds, and even surgical judgment, dates back half a century to the era when surgery was next to godliness and the "brilliant young surgeon" enjoyed something akin to the divine right of kings. There was something to be said for this paragon. There were not many of him in the community; he was well trained, and he knew it. He also knew that most of the specialists in his hospital lacked fundamental surgical training and had few opportunities of getting it. He was horrified—often justifiably—at their notions of asepsis; he appointed himself to keep a watchful eye on them, and it was just as well he did.

Things have changed.

Surgeons are now not exactly a dime a dozen but, let us say, fifty cents, which is in no way derogatory but denotes abundant supply. Glamour has worn thin. Since ability in surgeon and specialist is still the first criterion, a truly able man rarely finds himself subservient to anybody. Mutual respect between surgeons and specialists makes for autonomy. If it fails under this condition, look for greed in some form. If you should find a surgeon in one department barring those of another from witnessing his operations, your diagnosis is made.

* * *

Personal publicity, and the struggle for it, somehow fails to call forth the contempt that it used to. Time was when a doctor's picture in the paper (for anything short of his demise) or a personal interview with a reporter called for something speedy and drastic from the local ethics committee. Not now! The change took place when the full-time medico circumvented this by degrees on the theory that since he was not in private practice, airing his little triumphs in the Sunday paper was above the law. His institution, at the moment seeking new funds, found the publicity helpful and not only adopted his point of view but abetted him with its full resources.

Some medical men in 1956, occasionally even a near-first-rater, think nothing of permitting their portraits to grace the covers of throwaway magazines devoted to transcripts of articles warmed over from the straight-line journals and a pound or so of ads.

It is notable, in this era, that the patent medicine is accepted by all doctors; "ethical pharmaceuticals" is the term used now to designate medicines presumably not advertised to the laity. The doctor has always been expected to fa-

miliarize himself with the composition, pharmacological characteristics, indications, incompatibilities, and dangers of the medicines he prescribes, and he is not relieved of this responsibility, whether it is his own prescription or a patent pill; but the welter of new drugs and the polysyllabic labeling render this nigh impossible. Three years ago there were no less than 140,000 medicaments on the market; 14,000 were added in 1953 alone.

The present tendency to patent medicines had a very natural beginning. In the days when the physician composed prescriptions to suit himself, the elements resided in rows of ornamental jars on druggists' shelves. They were often grown, plucked, pounded, extracted and filtered by the pharmacist himself.

The manufacture of the complex synthetics of today requires a terrific capital expenditure: processing, standardizing, sterilizing, advertising. When a new type of medication is discovered, a rather characteristic symptom-complex sets in among the drug trade. It is often easily recognized, as for example, in the case of the vasoconstrictors, the antihistamines and the sulfonamides. Once the new drug shows evidence of long-term usefulness, boards of directors everywhere sit up in their chairs and lay plans for a share of the market. Laboratories begin to fiddle with the original formula in search of a related compound which will work as well, or better, or have fewer drawbacks, or failing these, will at least be sufficiently different from the original to be patentable and rate a trade name of its own. Sometimes a mere shifting of a hydrogen atom will do the business.

In the beginning this is all to the good, because the first modifications have a good chance of being improvements, but when the point is reached at which there are more manufacturers than modifications, tailenders appear which are inferior. Obviously, in such a group of similar products some are bound to be much better than others, but this will never show up in the publicity and the doctor is hard put to recognize all their names, let alone their qualifications. The specialist having frequent use for one group of drugs will ultimately be in a position to judge for himself; the general practitioner, a more occasional user, is almost compelled to rely on the detail man —in person or in print. In a recent issue of one of the throwaway journals, no less than 173 proprietary names were advertised. Comment was, of course, all favorable.

The manufacturer, to stay in business, has to market his product so as to ensure its reaching the patient in top condition, and he makes it very attractive. An English journal has recently decried this beautification of adult drugs on the ground that it induces children to eat them and poison themselves!

In terms of overhead, the druggist is highly in favor of the package deal, bottle or pill. Counting tablets from a stock bottle requires fewer man-hours per diem than compounding original prescriptions.

As to the patient, he (and especially *she*) loves a new capsule and appears to find special satisfaction in a two-toned pearl of great price. A woman recently returned to my office after having a new prescription filled for a dollar and a half, and seriously assured me that if I was trying to spare her pocket-book, I should forget it. She could afford six or eight dollars, "like the last time," and was all for quick results!

Is this progress? It could be.

It is not at all axiomatic that the doctor of a generation ago who composed his own prescriptions, varying drugs and doses to fit the case, was either very original or very intelligent about it. Most

likely, the busy practitioner of that day soon settled back upon a pretty routine list of formulas, either devised by himself or read out of a book, and the patient, then as now, survived.

Salesmanship has created fashions in drugs, as it has in clothes and motor cars. A decade ago, while we were still bejittered by the ravages of war and its aftermath, and had nothing to fear but fear, it was the vogue to keep a fine edge on wakefulness through the use of amphetamine or one of its many relatives, to the point of bootlegging it to truck-drivers on the highways.

Today, when we have less to worry about than at any other time in the past two generations, the accent is on keeping calm, through chemistry if need be. If you have a tilt with the bill collector, or get out of bed on the wrong foot, it's no good taking it out on your wife. You can keep sweet tempered with a small dose of ataractics from the bedside table: say Thorazine, or Rauwiloid, if you prefer, or Equanil, or Serpasil, or Pacatal, or Frenquel, or Sparine, or Reserpoid, or Raudixin, or Atarax, or a small pinch of Miltown.

Now will you be quiet?

* * *

When I left medical school, my respected professor, George Dock, delivered this parting crack: "Good-bye and good luck. And remember, don't learn your graduate medicine from the detail men."

Many times have I recalled this warning as I plowed through advertising pages or answered the ring of the pleasantly voluble young man with the satchel and the samples, and I can picture the consternation of my old chief if he could riffle through the recent advertising pages of the world's foremost medical journal and discover, tucked away there, another private little medical journal complete with papers and references, more beautifully illustrated than most others can afford, down to its own little cover, cartoons and advertising, edited and *copyrighted* by — none other than the detail man.

Verily this one has come into his own. That the articles could conceivably be slanted to augment sales, he may stoutly deny, and possibly with some truth. A glance at his financial report for last year, however, could easily lead one to the conclusion that this is probably the best paying medical journal in the world.

Medicine is Big Business, and one can learn a good deal about it from the financial pages. Wall Street is rubbing shoulders with Harley Street and Park Avenue, and for any slight abrasions this may cause there will no doubt be an expensive ointment.

The lead article in a little monthly *investment* journal, recently, was on a subject now very much in the medical mind, viz., geriatrics. It runs along for quite a number of pages of pure doctor talk, then mentions by name ten new drugs and the fortunate firms who make them. Another financial paper is worried by the fact that poliomyelitis "behaves so erratically—up one year, down the next." *The Wall Street Journal* cites "medical alarm" as one of the factors in the falling off of the seven-billion-dollar do-it-yourself industry. It seems that a certain medical man reported that every Monday he is sure to have three or four patients in for treatment who have fallen off ladders, or cut their hands badly, while doing something themselves.

Several months after the initial polio vaccine hullabaloo, *Barron's Weekly* sagely and cautiously observed that "the Salk vaccine appears to be proving out," noting that the profit margins based on the current price structure were excellent, the druggist buying 10 cc. for twenty dollars and selling it for thirty-three.

Triple play: Park to Madison to Wall!

Not long ago a headline in the morning paper read, "Medical Report Sends Stocks Up," and in an adjoining column, "Polio Fight Sold Like Hucksters Sell Soap." In the evening paper was a four-column ad for a popular TV show called "The Ion Knife," sponsored by a "tops" drug house together with a tops medical society.

My stockbroker rolls off the names of the new drugs like a medical student, and I sometimes think he knows more about them. In an age when the man—or the boy—in the street has only to switch on his television set to hear (and see) all about the menopause, he learns early the esoteric facts of life.

One of our favorite cartoonists draws a young mother saying to her husband, "Don't you think it's time you were telling Junior the story of the bees and the flowers?" and father replies, "I did, and he said I'd better see a psychiatrist."

I do not criticize; I am only reporting to Bill Wherry what I read in the papers in 1956.

* * *

By sheer force of numbers, the public, its medical background recently acquired at the newsstand, plays an important part in steering *res medica.* It needs only a few random statistics to put itself on record regarding almost anything at all, and many fantastic convictions grow and persist, regardless of the fact that they are based upon demonstrably false extrapolations.

For example: on the slimmest evidence, the public promptly accepted the dire relationship between tonsillectomy and poliomyelitis, which trained observers, after months of investigation, never established beyond the commonsense point of avoiding the operation in the midst of a known epidemic. In this it was encouraged by some rather special pleading from interested quarters.

The drawing-room controversies concerning cigarette smoke and its possible carcinogenic properties is another case in point. I have personally not the slightest doubt that excessive smoking may induce lung cancer, but this is based purely upon a loose association between the evidence of the effects of such tars on certain tissues, notably skin, and the likelihood that an as-yet-undetermined amount of tar must be deposited upon the respiratory mucosa by a couple of hundred puffs of cigarette smoke. To date I have uncovered no experimental work that offers anything more definite. Incidentally, my own observations in the laboratory (not connected with cancer) would suggest that a very infinitesimal part of the tar from inhaled smoke reaches the mucosa and remains there. What I think is immaterial. We are discussing the public and its presumptuous snap judgments.

The public is quite ready to accept the fact that two and two make twenty-two, which in a sense they do, if you happen to be a typographer; but if you are a banker, such arithmetic could land you in jail. We are put in mind of an engineering professor's pithy anecdote to drive home the fallacy of extrapolation from insufficient data:

> A woman fashionably attired in a long dress (that dates her) got onto a streetcar. She paid a ten cent fare (and so does that).
>
> A second woman, in a knee-length garment, paid only seven cents.
>
> A third one wore shorts. She paid only three cents.
>
> The fourth and last one didn't pay a cent. From the data available you might reasonably conclude that she was nude, but there you would be in error. This lady had a transfer.

* * *

Much is being written about medicine by medical men and by as many laymen as can spell the words, and journals flourish. The content and the nature of the writing reflect the prosperous times

and, to a certain extent, the way that money is now being distributed for research by governments and foundations of great wealth. Almost gone is the lonely, dedicated worker, with stars in his eyes and sausage for his dinner, giving his last ounce of strength and brains for science.

Research has become largely a community affair in which a group of specialists and technicians can cluster comfortably about the great Brain who heads the project—and the published papers—and who may be quite unfamiliar with the minutiae of the processes which enter into his summary and conclusions.

Until recently, multiple authorships were not the rule. In a selected list of journals in 1930 there were 19 per cent; in 1955 there were over 41 per cent. Like the group tendency in teaching, this group research can easily develop the lack of personal responsibility which is the weak spot in almost anything that is managed by a committee.

Medical literature has always harbored a small percentage of potboilers, articles with nothing much to say but written for personal propaganda, or to accommodate some secretary struggling to fill a program, or for any reason other than the legitimate one of having something new and progressive to impart.

In late years, sizable research grants from various foundations and corporations have bred a new kind of potboiler. These grants, running into four or five figures, entailing employment of several full-time technicians, and constituting much, if not all, of the income of the principals, are often on an annual basis and demand RESULTS to ensure renewal. In the very nature of things, results are often unspectacular, but the show must go on, and it's publish or perish. This accounts for a good deal that is repetitious in the literature, and its earmark is the line of fine print at the bottom, which reads, "This work was aided in part by a grant from . . . ."

Changes have crept into the semantics, too. New proper names now attach to old proper procedures, whose original authors abode their destined hours and went their way. The old familiar terms now wear new plastic covers: what used to be a mere "effect" is now an "impact." A former "subject," or "aspect," or "standpoint" is now an "area," as "a troublesome *area* in diabetes," "in the *area* of circulatory disturbances." "Spectrum," a refugee from optics, first attached itself to antibiotics (in the broad sense), then moved on to practically everything else; the and/or fraction of the old insurance blanks and other legal fine print is now high fashion. These are what spicy old Fowler (the English stylist, not our colleague) puts down as the "elegant variations of second-rate writers, intent on expressing themselves prettily."

Voluminous footnotes have finally been recognized as window-dressing and have been largely discarded.

Illustration is blooming with improved engraving processes and with improved bankrolls and, above all, with the gentle persuasion of specialists trained in medical drawing and photography.

* * *

Cult still follows cult. People who in other ages ran to Mesmer, Fletcher and Coué now bury their feet in mud, or radioactive fallout, or whatever it is.

Automation has not hit us yet, but it will. I can see the automated tonsillectomy just around the corner, with electronic circuit breakers to stop the machinery during the polio seasons. I rather think the gentle human touch will have to linger for a while in the surgery of the sinuses, except maybe the maxillary.

* * *

It has been popular with medical advertisers to include a few, more or less impressive, references to the literature in their copy. With advertisers of high ethical standards these are all that they appear to be; with others they are often the result of what might be called "instigated research." A doctor, usually a young clinician, is asked by the manufacturer to carry out some "clinical research" on his product, and to write a paper about it. A generous batch of medicine, later referred to as having been "kindly supplied by the J and X Company" and a check for a few hundred dollars, not later referred to, are given him. There is nothing remotely reprehensible or unsound in the arrangement, except that the young man is seldom chosen for his research training, and that in the rosy atmosphere of having been selected to do this important bit of research, the results are apt to show an astonishing superiority of the medicine over the feeble old last year's competitive products, "A," "B," and "C." If the paper is any good at all, and an editor can be induced to accept it, it can legitimately be quoted in the ads, and the publicity well repays the small investment.

* * *

Never was there a more fantastic story in medical annals, nor one which more completely typified the workings of Big Medicine (in the sense that one speaks of Big Business) than the one released on the morning of April 12, 1955. On that day the newspapers carried the word to every house and hamlet that a potent poliomyelitis vaccine had been discovered. The story broke with all the fanfare that Big Advertising could think up, which, to understate it, was quite a break. Every stop of the organ was pulled out, but in the paean of praise which issued forth there could presently be heard some sour notes. It was a field day for the Press, in an otherwise quiet season, and they made the most of it.

For weeks announcements and retractions, statements and denials, political incriminations, medical dicta—ex- and intra-cathedral—and of course the usual profundities of the columnists, vied for headlines. Here we had what may be considered a laboratory specimen of a current phenomenon which rates a few paragraphs in this report to Bill Wherry.

It is the phenomenon of a group of laymen engaged in subsidizing or underwriting an individual disease and all the corollary medical-social-financial issues and activities which that implies. In contemporary terms, the machinery includes an administrative, fund-raising "Foundation" with a high-pressure sales organization, local and national campaigns, astronomical finances, and, among other things, a lavish distribution of medical grants. Sparked by the emotional appeal of the afflicted, and a universal call, not even for dollars but for dimes, it reaches for every pocket and every conscience. It is an amazing example of the power of advertising in America. In a recent news release, the Foundation announced

> . . . a total of $21,562,456 [of] the March of Dimes funds authorized since 1938 for the National Foundation's comprehensive program of professional education, the largest ever undertaken by a voluntary agency. In all, 5,334 scholarships and fellowships have been awarded by the National Foundation from 1938 through August 30, 1955.

Polio attacks not over 38,000 people annually in the United States, and only a fraction of these suffer disabling results. One writer, commenting upon this, says, "Statistically more than three times as many people in this country die of homicide as die of polio." And adds, "A vaccine is a good thing to have, so is a bullet proof vest—and the chances of

the average person needing the polio vaccine are no greater than of his needing the bullet proof vest."

In 1954 alone, eight of such agencies financing separate "fights" against individual diseases raised a total of $140,037,029. The cost of raising these funds ranged from $96.00 to $140.00 per thousand dollars—9.6 per cent to 14 per cent.

The extent to which professional publicity and public relations firms now enter into things medical is exemplified by a news release recently received from one of them announcing an event of no more public interest than the coming annual meeting of one of our national special societies. The sales approach which induced such a society to spend good dues on something it needed "like it needs" a trepanation must have been hypnotic indeed.

It is not uncommon to encounter technical medical information in the morning paper at breakfast, which will only pop up in the medical press some hours, or days, later at the office. I recall that when one of the early antihistamines was announced, three patients asked me for it on the same morning before I had got around to opening the mail to find out what it was. It seems that news of the Great Discovery had leaked out at a bridge party the previous afternoon, when the hostess had written down for each of them the magic word: TORANTIL.

* * *

As so often happens, we have devoted a very small part of this hour to the sorry wight to whom the whole shebang of medicine is supposed to be devoted: the patient. Where he stands at the moment, except that he actually lives longer than he used to, is not too clear. That he has more and better medicines and diagnostic tests available to him than ever before is incontestable; whether they are selectively and intelligently brought to him on the basis of human sympathy and a deep understanding of his personal problem is sometimes open to grave doubt.

Add to the 140,000 medicaments mentioned a while back the 129 standard laboratory procedures I recently saw listed in a hospital price sheet, and you have a formidable foundation for the high cost of medical care, or what it often comes to, *redundant* medical care.

Taken all together, what with the man-hours of the doctor and the woman-hours of the nurse, with board and lodging and the ancillary services appended, it approaches only the income tax in awesomeness.

As my 1956 reflection on this subject, I beg leave to read into this record a clipping from a St. Louis paper of April 21, which I regard as the thumbnail sketch of the year. It is headed: STUDENT LEARNS IT COSTS HIM $36.70 TO BE A HERO.

It seems that young Henry McN.

> . . . swam 500 yards through cold, choppy waters last week to aid Fred P., 12 years old, who was drifting out to sea in a rowboat. McN. rowed the boat back to shore.
>
> Thoroughly chilled, he was held overnight at S— Hospital for observation, and spent another day at home, resting up.
>
> The hospital bill arrived yesterday: $24.35 for room and board; $12.00 for laboratory fees and thirty-five cents for a prescription.
>
> A student at W— Institute, McN. says he doesn't have the money and he doesn't know where he can get it. He does odd jobs to support his wife and child.

I quote this merely to suggest that in an era when a prescription can still be had for thirty-five cents, all is not lost.

* * *

In a very thought-provoking article entitled "Hazards of Modern Diagnosis and Therapy," David Barr, of Cornell, has pointed out the dangers of the indiscriminate use of new and unfamiliar

drugs and, especially, the effects of modifying the internal environment by multiple diagnostic and therapeutic procedures simultaneously applied. He writes:

> A seriously ill patient or one who has been subjected to a major operation may receive twenty to forty different drugs in addition to numerous mechanical procedures. His management may actually require the use of anesthetics, sedatives, narcotics, antibiotics in variety. phenylephrine (neosynephrin) hydrochloride, arterenol, digitalis, diuretics, bis-hydroxy-coumarin, cortisone, transfusions, infusions and finally antihistaminics, either for the correction of symptoms of his disease or to combat the toxic manifestations of other drugs. Since such combinations of measures and medicines are frequent, it is not surprising that iatrogenic disturbances are frequent.

He reports that in a period when approximately a thousand patients were admitted to a large hospital, "more than fifty major toxic reactions and accidents were encountered." Some of these were the cause of the hospitalization, others occurred in the wards.

He reflects that in view of this 5 per cent of "unfortunate sequelae and accidents attributable to sanctioned and well-intentioned diagnosis," iatrogenic disease was one of the commonest conditions encountered in the period.

President Eisenhower may not have been talking specifically to us medical men of 1956, but he put his finger on the button when he observed that "the great genius is the man who can do the average thing when everybody else is going crazy."

* * *

Summary and Conclusions? This lecture is in itself a summary, and I promised at the beginning only to put down what I saw, and to let you and Bill Wherry draw your own conclusions.

Any attempt to epitomize this age in medicine, as indeed in almost everything else, would result in oversimplification, but perhaps it would not be too simple to suggest that the old ideal of healing the sick and giving them comfort as well as physic still has its points. What comfort to them, failing and afraid, to know as they sailed past him on some production line, that the Big Man running the show invented a new virus and got his picture in the paper?

Souls and cells are somewhat confused in this complex era, characterized by curious paradoxes of prosperity, uncertainty and—let's face it—fright: the highest standard of living and fear of inflation; the senseless chain-smoking and fear of cancer; double overtime, vacations with pay, and fear of indigence; wonder-upon-wonder drugs and fear of viruses; overindulgence and fear of fat; the lengthening span of life and fear of old age.

"I live all the time like a king," writes Don Herold, "whose enemies have threatened to poison him." The blessings of today and the brilliant promises of tomorrow seem not only too good to be true but also too hard to bear.

Here in medicine there is a crying need for leadership to take us out of this nonsense; and let us lay the challenge right where it belongs—in the lap of the Professors. They alone can teach the coming doctor, in his formative years, the crashing difference between culture and mere knowledge; between leadership and mere prominence. They, and only they, by guidance and example can lift him above the great flood of mere technicians and inspire him to regain some of the lost dignity of his calling.

It requires a strong constitution to keep up with 1956.

I have just read somewhere that the latest wonder drug is so powerful that you can't take it unless you are in perfect health.

PRESBYCUSIS

JOSEPH SATALOFF, M.D.

and

HYMAN MENDUKE, PH.D.

BY INVITATION

PHILADELPHIA, PENNSYLVANIA

IN the past half century, the number of Americans 65 years of age and older has increased from approximately three million to more than fourteen million and, it is estimated, will reach twenty-one million by 1975. This increase does not reflect merely an increase in total population, since our "senior citizens" are becoming a larger and larger proportion of the total population.

The physiologic loss of hearing acuity in older individuals brings with it a number of problems. Among these are (1) the difficulties in distinguishing hearing losses due to presbycusis from losses associated with long exposure to intense industrial noise and (2) the psychological disturbances often associated with advanced presbycusis. The frequent inadequacy of present-day hearing aids in the management of deafness due to presbycusis is also an important consideration.

These problems have been investigated in a number of ways. Crowe, Guild and Polvogt,[1] and Schuknecht[4] have studied both animals and humans to correlate certain psychological phenomena with pathological findings in the ears. The Z24-X-2 Committee of The American Standards Association* has attempted to give a reasonable estimate of average values for presbycusis in order to allow for this condition in individuals with industrial deafness. Large-scale hearing studies held at the New York World's Fair and at the San Diego Fair established approximate hearing-loss–age relationships. Additional data from the Wisconsin Fair are currently being evaluated. Others have investigated the psychological and communicative problems associated with presbycusis.

In most studies, however, the emphasis has been on individuals up to the age of 60 or 65. Little information has been included on older subjects. In an attempt to broaden the study area, the present investigation, therefore, has been devoted to an analysis of pure tone hearing thresholds in these older individuals.

Material and Methods

The subjects in this study consisted of 94 men, age 65 to 91, and 101 women, age 64 to 93. The study includes individuals with rather diverse backgrounds. Some were private office patients; some came from private institutions for reasonably well-to-do individuals; others came from institutions for rather poor individuals. One group consisted of men in very good health from a U. S. Naval Home for the Aged; another group has a number of members who were not ambulatory because of arthritis or senility.

Since most of the office patients had primary complaints other than deafness,

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Presented at the Sixty-First Annual Session of the American Academy of Ophthalmology and Otolaryngology, Oct. 14-19, 1956, Chicago.

*The Relations of Hearing Loss to Noise Exposure, Report of Exploratory Committee, 1954.

and since hearing tests were often only incidental observations, the inclusion of a group of private patients is probably not a source of bias in this instance.

Only subjects who were sufficiently cooperative to give reliable audiograms were considered for inclusion in the study. Prior to each hearing test, a brief history was obtained and an otological examination performed.

Because of language barriers and difficulties in communication with some of the older people, it was necessary to keep at a minimum the number and complexity of the questions asked. Emphasis was placed on age, history of ear infection, dizziness, tinnitus, occupations, and exposure to gunfire and industrial noise. When possible, answers were verified through nurses, attendants, physicians, and history charts. It was particularly necessary to verify age from official records, since many women, and an occasional man, understated age by as much as ten, or even fifteen, years.

It had been decided at the start of the investigation to restrict the study to presbycusis and to exclude loss resulting from significant acoustic trauma. Fortunately, very few individuals gave such histories.

Individuals with pathologic conditions of the middle ear other than the changes normally expected in the senile, were excluded as were those suffering from the common cold or other acute infections likely to have an effect on hearing.

All hearing tests were done by the authors with the help of a trained assistant. The same calibrated 6BP Western Electric Audiometer with double (705-A) earphones was used throughout. The calibration of the instrument was checked daily on several normal ears prior to and after its use on subjects in the study.

A standard audiometric technique was used to test each ear separately at all octave frequencies between 256 and 8192 cycles per second inclusive. At least two, and generally three, consistent thresholds were obtained for 1024 cycles and higher frequencies.

The office subjects were tested in a very quiet room (ambient noise level below 35 decibels). All others were tested in the quietest rooms available at the various institutions. The highest ambient noise level was 65 decibels on the C scale of the sound level meter; most of the others were at 55 decibels or less, with low frequencies predominating. Hearing tests done on normal ears in the same rooms showed no observable effect on thresholds for 1024 and higher frequencies. Thresholds at 256 and 512 cycles were sometimes unaffected; when reduced, the change was at most 15 and 10 decibels respectively.

In our study no attempt was made to "correct" measurements at 256 and 512 cycles for ambient noise effect, especially since the people tested often had subjective difficulty in determining thresholds at these frequencies. Results at the lower frequencies are, therefore, considered less reliable than those at the higher frequencies.

For statistical purposes, it was decided to use the threshold in the better ear for each individual, with an auxiliary analysis of the difference between the better and the worse ear.

At each frequency, for men and for women separately, threshold loss in the better ear was plotted against age. Previous reports in individuals below the age of 65 revealed that hearing loss, particularly in men, accelerated with age. In this present study there was no visual evidence of any such acceleration past the age of 65. Hence, straight lines were fitted to represent the average relationships of hearing loss to age.

At 8192 cycles, the limit of the audiometer was 80 decibels. Such a high proportion of subjects had a loss greater than the audiometer could measure that no formal correlation analysis was attempted. Instead, the incidence of total loss was determined separately for the younger half and for the older half of the group.

great loss at this high frequency by age 65 that both had roughly the same average loss by age 90.

Most of the age-65-to-age-90 differences in hearing loss were rather small. It should be pointed out that even the few that were rather substantial represent only average differences and tell nothing about individual variation.

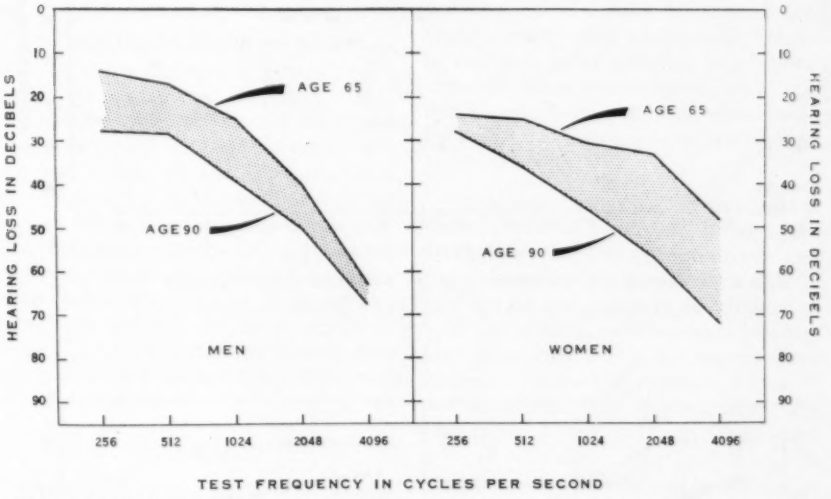

FIG. 1—Estimated average hearing loss in the better ear, at age 65 and age 90 for men and for women, at test frequencies from 256 to 4096 cps.

RESULTS

Results of the analysis for 256 to 4096 cycles are presented in figure 1.

The spread between the top curve and the bottom curve represents the average difference in hearing loss between age 65 and age 90. This difference was fairly constant from frequency to frequency in men, except for the very small value for 4096 cycles. In women, however, there was a significant increase in the spread with increase in frequency. It may be noted that despite the much greater difference for women than for men at 4096 cycles, men had such a

As an illustration of the nature of the hearing loss-age relationship, individual hearing losses for men at 1024 cycles are shown in figure 2. It is apparent from this figure that there is a low correlation between hearing loss and age; that is, past the age of 65 an individual's age gives little information concerning his expected hearing loss. It is evident that the variation is appreciable, even at any particular age, with a spread of 50 or 60 decibels not at all uncommon.

At 8192 cycles, 60 per cent of the men had no measurable hearing in either ear, while the remaining 40 per cent did

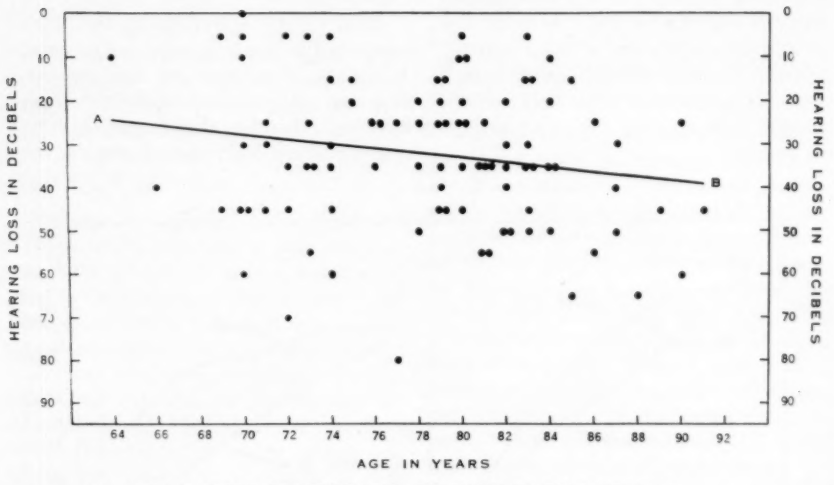

FIG. 2—Hearing loss in the better ear at 1024 cps in 94 men, age 64 to 91.

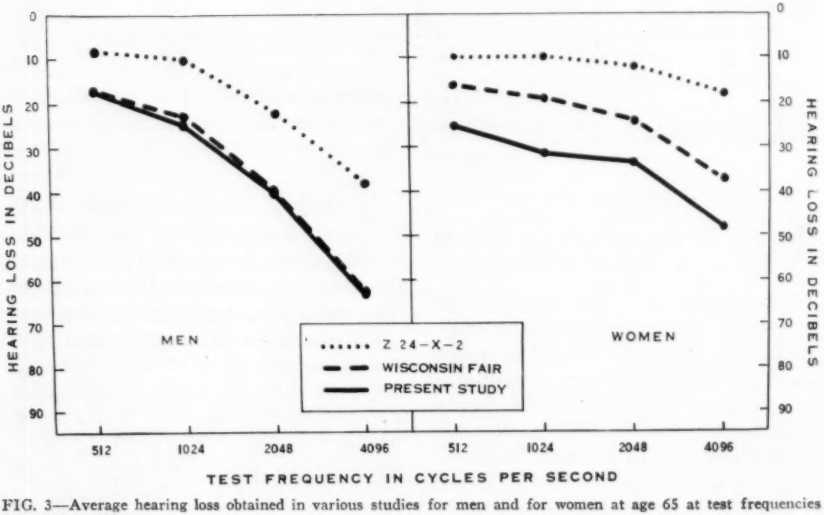

FIG. 3—Average hearing loss obtained in various studies for men and for women at age 65 at test frequencies from 512 to 4096 cps.

have some hearing in at least one ear. These proportions did not vary significantly with age. Only 36 per cent of women below the median age of 76 had no hearing at 8192 cycles, while 61 per cent who were 76 years old and over had no hearing at this frequency. Thus, women over 76 seem to have about the same hearing loss as men at this high frequency, while women under the age of 76 years seem to have a smaller hearing loss than men of similar age.

The difference between the better ear and the worse ear was, in general, quite small. At any given frequency, from 256 to 4096 cycles per second, about one fourth of the subjects had the same hearing loss in both ears and an additional one third had a difference between the loss in the two ears of only 5 decibels. Roughly, three fourths had a difference of 10 decibels or less, and only about one in ten had a difference of 20 decibels or more. The greatest difference observed, in the absence of middle ear disease, was 40 decibels, but such a large difference was observed rarely.

DISCUSSION

The results of our study indicate that little of the variation in hearing loss can be accounted for by age differences after age 65. This is consistent with the thesis that little additional hearing loss takes place after age 65. Before any definite conclusion can be reached, however, individual patients must be followed in long-term studies.

Such studies might well disclose that additional hearing loss incurred after age 65 is a function of level of hearing at age 65.

It is of interest to compare average losses at age 65 in the present study with average losses at age 60-69 reported by the Z24-X-2 Committee and by the Wisconsin Fair Group. In figure 3, values from the present study indicate considerably greater losses than those reported by the Z24-X-2 Committee; they are quite similar, particularly in men, to those from the Wisconsin Fair.

It should be emphasized that the findings reported in this study are for pure tones only and do not indicate the ability of an elderly individual to hear and understand speech. Some of these pure tone losses may reflect, primarily, epithelial atrophy. Crowe, Guild and Polvogt,[1] Saxen,[3] and particularly Schuknecht,[4] have called attention to a "neural atrophy" often superimposed upon epithelial atrophy and clinically manifested by a loss of discrimination ability and auditory acuity.

Pestalozza and Shore[2] and others found a lack of agreement between the average hearing loss for pure tones and the threshold for spondees in elderly subjects, as well as severe discrimination losses even with good low-note hearing. Our experience seems to confirm these findings. Phonetically balanced words and sometimes even spondee words are frequently heard but not understood even at well above threshold levels. In younger subjects with presbycusis, it is often possible to estimate speech reception loss by averaging the pure tone losses from 500 to 2000 cycles; in aged patients, such an average may be highly misleading. Separate speech reception and discrimination tests should, therefore, be made in addition to the pure tone audiogram.

SUMMARY

1. Threshold losses were measured in 94 men and 101 women between the ages of 64 and 93 who gave no history of significant acoustic trauma or disease.
2. There was a rather low degree of correlation between hearing loss and age after age 65.

3. Results were consistent with the thesis that little additional hearing is lost after age 65. Long-term follow-up studies on individual subjects are needed, however, before this can be advanced as a definite conclusion.

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DISCUSSION

ABRAHAM I. GOLDNER, M.D., Flushing, L. I., New York: Last night, following the presentation of the paper on "Geriatric Otology" by Dr. Bordley and that on "Medical Significance of the Wisconsin State Fair Findings" by Dr. Glorig, I had an opportunity to discuss some problems of presbycusis. This excellent paper by Dr. Sataloff and Dr. Menduke has helped confirm some clinical impressions that I have made in the evaluation of thousands of patients with industrial deafness and other types of deafness, particularly in the later age groups.

It occurs to me that the term presbycusis is misleading, and that one is tempted to classify presbycusis as being somewhat similar to presbyopia, the incidence of which evidences almost a mathematical correlation between age and muscular weakness that requires correction. It becomes increasingly apparent that the term presbycusis should be reserved for those relatively few cases of hearing impairment in patients well advanced in years who show actual senescent changes due to death of sensory cells rather than degenerative changes as a result of vascular disease, toxic substances, or the influence of excessive noise. The term presbycusis has led some physicians and many laymen to assume glibly that any individual beyond the age of 50 years, and even sooner, must inevitably have a hearing loss, and in medical-legal problems, various deductions must routinely be made.

Dr. Sataloff's paper, my own experience, and the experience of others, have shown that many individuals at age 50 and beyond indeed have normal hearing.

Furthermore, if you will try to visualize the average pattern of loss of hearing as found in occupational hearing impairment at an average age of 30 years to 40 years, the pattern is quite similar to the graph of average hearing loss as presented by Dr. Sataloff, and also to the X-2 or Wisconsin findings in certain age groups. While it is true that at age 35 or 40, or thereabouts, individuals with a hearing loss of this type do not appear to have very many communication difficulties, this study by Dr. Sataloff and Dr. Menduke appears to indicate that as an individual becomes older and as the additional effect of supracochlear damage becomes apparent, this same man becomes distinctly handicapped, is deprived of the pleasures of normal hearing, and very often retreats into himself.

HISTOPATHOLOGY OF ANKYLOSIS OF THE STAPES FOOTPLATE

Dedicated to Professor Dr. Gustav Hofer, Graz, Austria, on the occasion of his seventieth birthday

EDMUND P. FOWLER, JR., M.D.
NEW YORK, NEW YORK

MORE basic knowledge about stapes fixation is vital if we are to improve the techniques now used to alleviate the conduction deafness of otosclerosis. This paper will describe the ankylosed and partially fixed specimens available to the author, but much more histologic material is needed for a thorough understanding of the many ways in which the stapes can be hampered in its movements by otosclerosis, as well as by other types of disease. The recent paper by Ruedi[23] of Zurich, describing some eighty cases of otosclerosis, will help, but even this is not complete. Nowhere in the world do we have enough autopsy material accompanied by good case histories and audiometric data. Until these are obtained we must carefully restudy the specimens and published data available.

OBSERVATIONS

Otosclerosis may be associated with either fibrous or bony changes in the niche of the oval window. However, the osteoporosis and osteogenesis in the labyrinthine capsule can be quite extensive and yet produce no characteristic pattern of symptoms at all.[7,8,9,15,18,25] There are several different ways in which the stapes has been found to be bound down so that it appears, from histologic observation, that the perilymph of the labyrinth might not move normally when subjected to air-borne sound. The types of stapes fixation found in our specimens are as follows:

1. Anterior fibrous adhesions may grow across the promontory from the anterior border of the oval window, thus potentially hobbling the stapes (fig. 1, D). This may occur because of inflammatory processes alone or with calcification of the annular ligament, but it is quite common with otosclerosis, even without demonstrable bony bridges. Just how much deafness will be caused by such a lesion is always speculative. Guild and his co-workers[7,8,9] have described cases in which the ankylosis was histologically confined to the anterior crus (as in fig. 1, D), where no deafness was detectable.

2. The head of the stapes can be fixed to the promontory. This is probably, but not necessarily, a concomitant of inflammatory disease rather than of otosclerotic disease. It can be associated with head trauma.

3. Bony bridges can occur outside the annular ligament. In this case there usually is a history of otitis media in childhood. Exostoses and adhesions can occur behind the posterior crus. There may also be considerable otosclerosis (fig. 3). Hyperostoses and disease occur in the site of predilection, anteriorly (fig. 4).

From the Department of Otolaryngology, College of Physicians and Surgeons, Columbia University, under grants from the Central Bureau of Research of the American Otological Society and the New York Foundation.

Presented at the *Special Program* of the Otosclerosis Study Group and the Committee of Conservation of Hearing at the Sixty-First Annual Session of the American Academy of Ophthalmology and Otolaryngology, Oct. 14, 1956, Chicago.

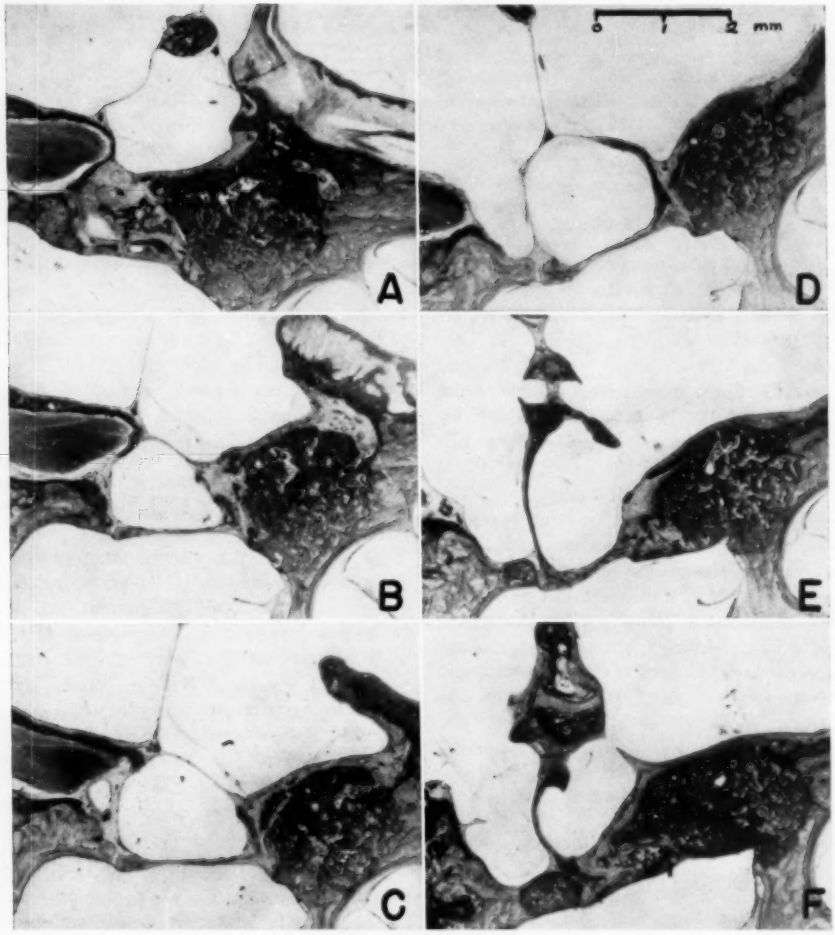

FIG. 1—Ankylosis of the right stapes (case 14884). This shows many of the types of ankylosis. The sections shown are approximately 0.5 mm. apart. (A) Section through superoanterior end of the footplate, showing calcification and new bone growth in the niche in front of the anterior crus of the stapes. (B, C, D) Fibrous and calcareous ankylosis of the anterior crus to a typical otosclerotic process in the site of predilection. (E) Displacement of posterior part of the footplate. (F) Partial ankylosis of posterior part of the footplate of the stapes and the posterior crus. For audiogram of this case, see figure 2.

4. Calcified concretions can occur within the annular ligament, and in such a position they could hobble the stapedial movements (fig. 5). These concretions can completely bridge the annular ligament (fig. 6) and are usually present with fibrous adhesions to the anterior crus (fig. 1, A, B and C).

5. The annular ligament can be narrowed by bony invasion. Such invasion

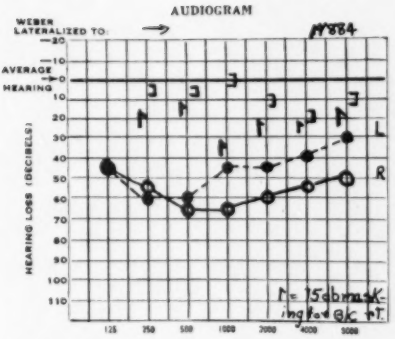

FIG. 2—Audiogram of case illustrated in figure 1.

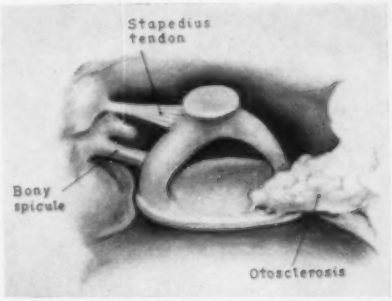

FIG. 3—Drawing from serial sections showing ankylosis of posterior crus with a bony spicule and ankylosis of the anterior crus and footplate with hyperostotic mass of otosclerosis. For details, see figure 4.

can reduce the elasticity and scope of normal stapedial movements. It can occur either anteriorly or posteriorly to the stapes, or from the stapes itself (fig. 7).

6. The annular ligament can be altered by displacement of the footplate of the stapes from its normal position (fig. 1, E).

7. A tiny bony bridge can halt the movement of the anterior margin (fig. 8).

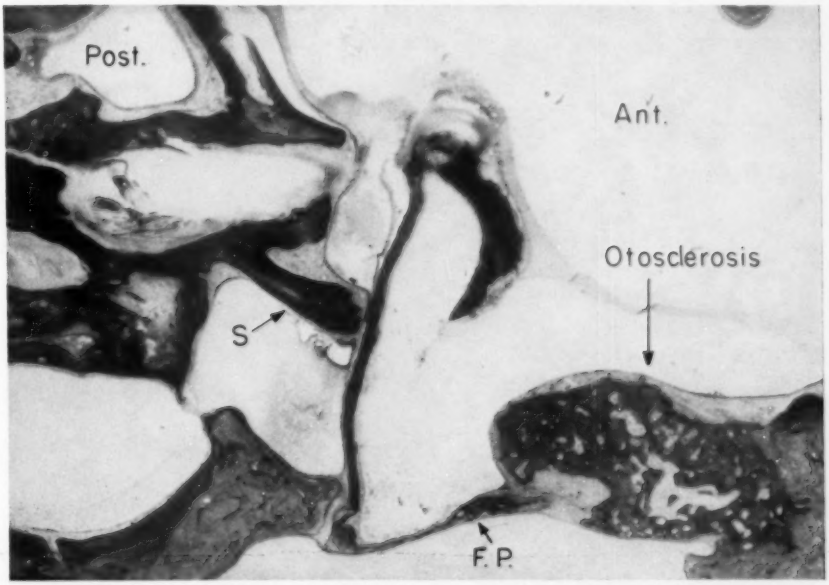

FIG. 4—Changes in one section from case sketched in figure 3. Note spicule of bone (S) against the posterior crus and the mass of otosclerosis over the footplate (F.P.). This mass impinged not only on the footplate but also on the anterior crus.

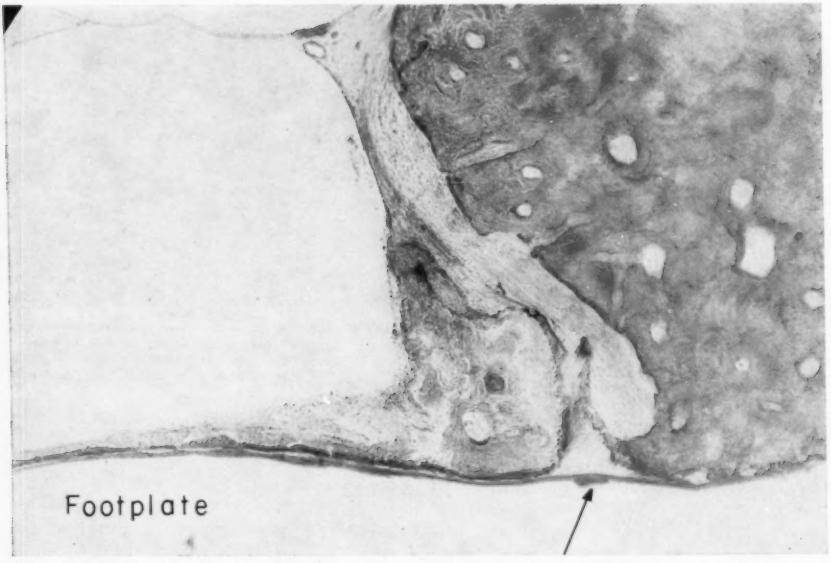

FIG. 5—Beginning ankylosis of the stapes by calcification of the annular ligament (arrow). Note also the very thin normal footplate.

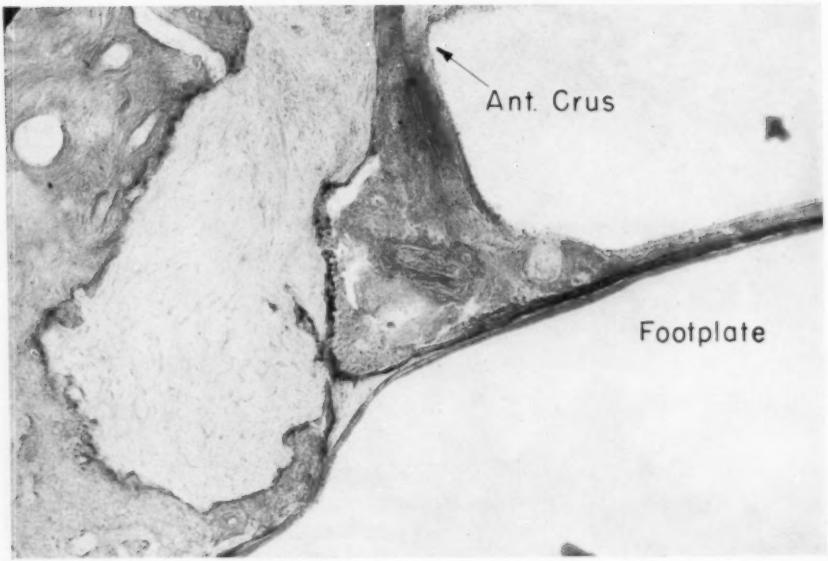

FIG. 6—Anterior crus held by fibrous tissue from the otosclerotic focus at the site of predilection. In addition there is ankylosis of the calcified bridge.

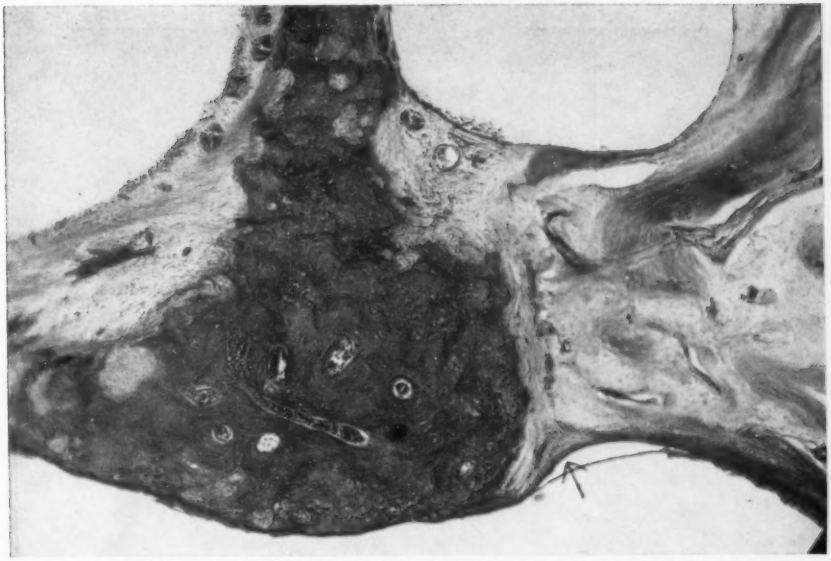

FIG. 7—Narrowing of the annular ligament posteriorly by otosclerosis in the heel of the footplate.

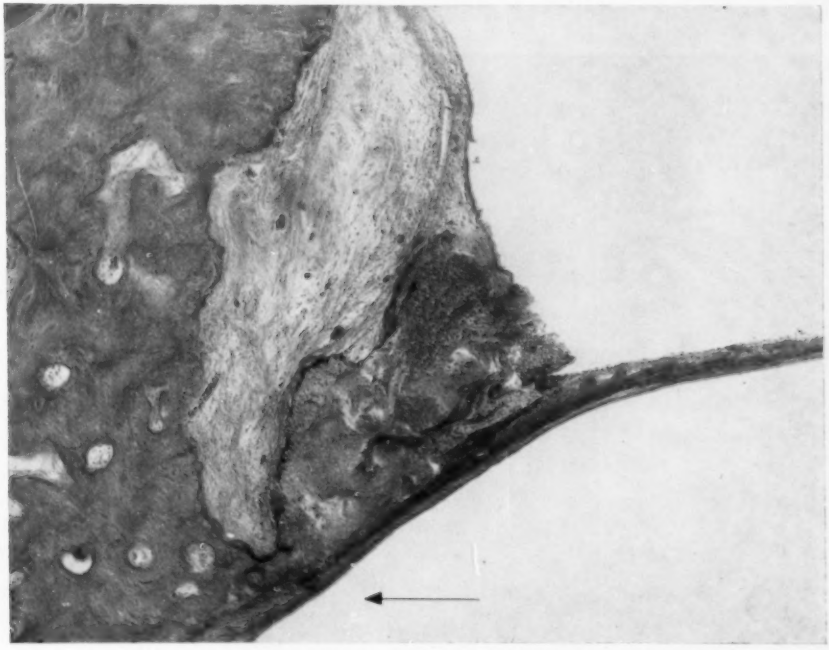

FIG. 8—Small bony bridge from the focus in the site of predilection anteriorly (arrow).

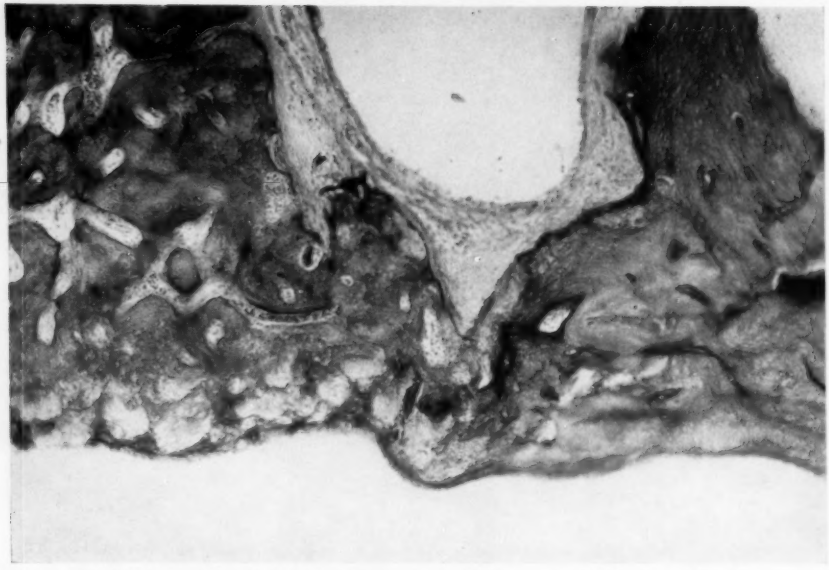

FIG. 9—Large bony bridge in anterosuperior margin of otosclerosis in stapes footplate.

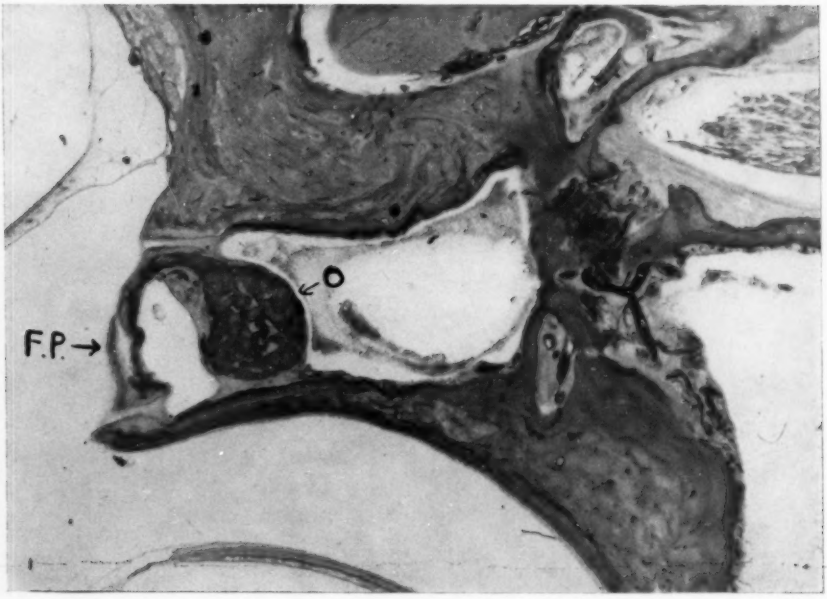

FIG. 10—Otosclerosis from heel of stapes and posterior crus impinging on niche posteriorly (audiogram, figure 11). Vertical section. F.P.—footplate; O—otosclerosis.

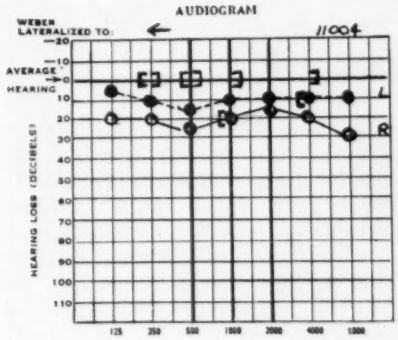

FIG. 11—Slight hearing loss in right ear of patient whose case was illustrated in figure 10; normal hearing on the left.

8. Single or multiple bridges of various sizes, of mixed bone and calcified spicules, can occur at any margin, apparently regardless of the positions of the main focus (fig. 1, A and F, and fig. 9). The clinical importance of this finding will be discussed in detail later.

9. The focus of disease can be in the footplate and crura and impinge on the stapes niche from within (fig. 10). Incidentally, in such cases the size and weight of the stapes are markedly increased. This would increase the inertia of the ossicular chain, thus, theoretically at least, hampering the movement of perilymph (fig. 11).

10. There can be massive bony ankylosis involving (a) one third or less of the footplate; (b) half or two thirds of the footplate; (c) the entire rim of the footplate; or (d) all, or almost all, of the footplate (fig. 12). (See also Brühl.[4])

DISCUSSION

When Rosen[19,20,22] reported his mobilization procedure in 1953, nearly everyone was skeptical that the results from the manipulation described could be permanent. "How," asked these skep-

FIG. 12—Bony ankylosis, superiorly and anteriorly, in a patient with otosclerosis in the footplate. There was also a large mass in the site of predilection, with ankylosis further forward.

tics, "is it possible to shake loose a joint ankylosed with new bone, and then to keep it mobile?" If we read Rosen's original papers and those of his disciples,[3,6,13,16,24] this is still a good question; for those writers all seem to assume that Rosen's manipulation at the neck of the stapes actually loosens the whole footplate in the oval window by breaking through the disease process. Study of histologic material, such as is found in the present paper, makes this appear possible in very few, if any, patients.

An almost classical example of stapes ankylosis is illustrated in figure 1, and the audiogram of the patient concerned is shown in figure 2. An ankylosis such as this, or such as those shown in figures 9 and 12, could hardly be broken through by the Rosen maneuver of pushing gently, but harder and harder, backwards on the neck of the stapes until it "suddenly" is properly mobilized with permanent normal, or near normal, hearing as a result.[3,24] Similarly, these cases do not appear to be particularly amenable to the stapes head maneuvers of Goodhill[6] or House.[13] Nor does the case in figure 1 look like an easy one in which to lift the edge of the stapes footplate like a manhole cover to mobilize it, as is envisioned by some workers who practice footplate mobilization after breaking one or both crura.

Actual surgical manipulation experiments, reported elsewhere,[5] suggest that there is a much more plausible explanation for the success of the operation, when it occurs, than loosening up, or "lysis," of an ankylosed joint. I believe that in all successful maneuvers a normal part of the footplate is broken, and probably in many of the best cases, a fracture of one crus occurs as well. The normal footplate is very thin endochondral bone, and it does not, as far as we know, heal by bony union.[1] It is like the bony capsule of the labyrinth in this respect.[17] To my mind, a fracture through, or shattering of, a normal part of the footplate is the only logical explanation for the success of present-day stapes mobilization procedures. This point of view was originally engendered by study of histologic specimens; Zollner's observation of an evulsed stapes, fractured through the posterior crus and footplate[27]; and the observations of Hallpike,[11] Altmann,[1] and others, that the fractured footplate does not heal by bony union.

In the preparation of this paper I ran across a specimen which I believe helps to prove my point. During fenestration surgery, the stapes is often mobilized inadvertently. In addition to Zollner's observation mentioned above, this was clearly brought out to me in Dr. Howard House's operating room, during two fenestration operations in which we were, incidentally, trying to study the mechanisms of mobilization.[12] We were surprised to find mobilization of the stapes in one case, and almost complete evulsion of the stapes in the other, when we looked at the stapes with an operating microscope after complete mobilization of the flap and final breaking down of the posterior canal wall. Incidentally, the hearing in all of these cases improved after fenestration.[26]

In our collection there is a temporal bone taken from a patient of Dr. Woodman's,[26] in whom a standard fenestration operation had been performed three weeks before he died of thrombotic emboli. In this case the stapes was apparently mobilized through the only normal area left in the stapes (fig. 13). This fracture can be seen in fifty vertical sections, each about 25 microns in thickness.

On the basis of these observations, I elaborated an operation where one crus of the stapes is deliberately cut with a

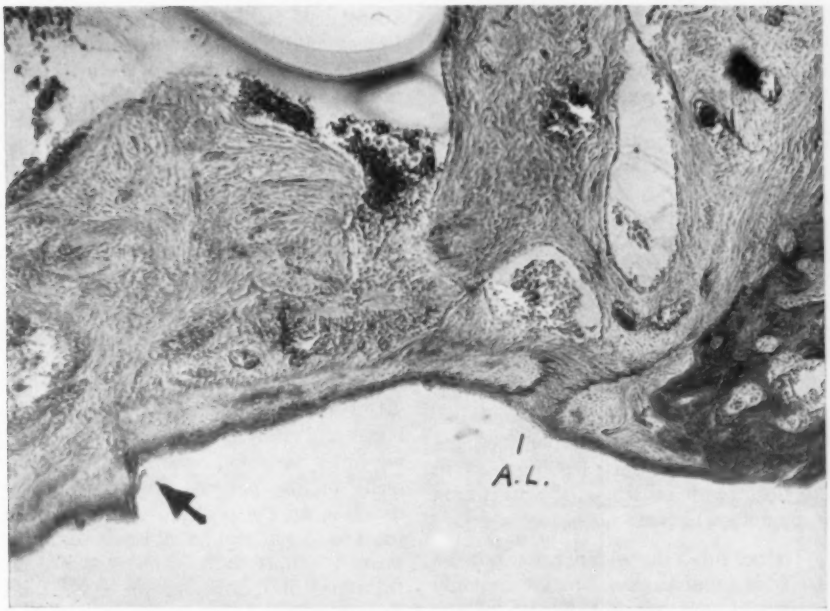

FIG. 13—Fracture of footplate following fenestration with fragment displacement (arrow). The break was a little over 1 mm. long and through the posterior portion of the stapes, which was not involved by otosclerosis. (A.L. is annular ligament.)

shearing motion to fracture the footplate. I believed, at first, that since otosclerosis is most commonly found in the anterior border of the oval window, the ankylosis must also most often occur there. I therefore began by cutting the anterior crus. Deliberate severance of a crus surprised those who wrote that the operation was a failure if "one or both crura were fractured." The latter notion cannot be correct, for not only I but also my colleagues, Dr. Altmann and Dr. Basek, have performed the operation of anterior crurotomy many times, with a higher percentage of patients with socially adequate hearing as a result than we obtained when we used the original Rosen maneuver. I know of other men who have tried deliberate anterior crurotomy with success.[26]

On the surface, this might seem to be all that there is to be said on the subject, but I regret to say that this is not true. I was much disturbed when very good improvement of hearing resulted in cases in which both crura had been removed. Then I read Dr. Rosen's paper on mobilization of the footplate[21] and learned that many audiograms made by him after fracture of both crura and after perforation or other manipulation of the footplate showed nearly normal hearing. This seems to undermine all our previous observations and theories in regard to the importance of the ossicles for hearing. It became clear to me in Montreal[13] that Rosen's good results with stapes-neck manipulation and the results of others with stapes-head, or transincudal, manipulation were generally as good, and often better, than those obtained with my anterior crurotomy

with footplate fracture. I was forced to consider the possibility that all of our maneuvers primarily fracture part of the footplate and that ossicular continuity is not as often attained as we have been led to believe. Meanwhile, it was discovered that there was a great deal of intrinsic elasticity in the crura of the stapes and the footplate.[2] Then there was the possibility that although the anterior border of the oval window is the most common site for otosclerosis, the ankylosis itself may not involve the anterior crus sufficiently to cause any deafness.

With further study of histologic material, my former opinion that, as a rule, only the anterior part of the footplate and the anterior crus are involved in ankylosis with otosclerosis[5] was found to be not quite correct.

To be sure, the otosclerotic process itself is statistically most commonly present in the anterior border of the oval window and there are very often fibrous connections there.[7,8,9,15,18,25] However, the present study reveals that the only bony ankylosis can be near the posterior margin of the oval window even when a large mass of otosclerotic bone is present in the anterior border of the oval window (fig. 1). This complicates matters, and we must therefore study every case individually while the patient is on the operating table. The number of cases in this study are statistically small, but this does not contradict the observation that too often the crucial deafening bony, or calcified, ankylosis may not involve the anterior crus.

The problem now is to find a way to achieve footplate fracture more often, without danger to the patient. If current theories as to the role of the ossicles for the hearing of weak sounds are correct, we must also find a way to keep at least one crus of the stapes intact and attached to a mobile fragment of the footplate. Ideally, we should find a way to ascertain the site of the ankylosis in the living patient before we start mobilizing. Thus, we may find a technique to increase the percentage of improved cases in this type of surgery and also find a way to increase the percentage of patients with no hearing loss whatsoever after surgery. Meanwhile, we might find out why it is that sometimes the hearing regresses after initially successful surgery.

I do not believe that these things can be done without more knowledge of the disease processes involved in otosclerosis. We must take out more temporal bones and study them histologically, and we must have audiograms taken previously on the patients we subsequently examine on the post-mortem table. We must have material on all kinds of ankylosis. We must have valid statistics on the types of fixation of the stapes and their location. I will have accomplished the purpose of this communication if I have impressed on you the meagerness of our present knowledge and thus fired you with enthusiasm to help those who can process histologic material to amass an adequate amount of data to establish proper techniques for alleviating deafness from stapes ankylosis. The methods for removal of the temporal bones have been well documented by Guild[10] and Kelemen.[14] They can be found in the appendix of *Medicine of the Ear*, and there is a diagram in Ash and Raum's *An Atlas of Otolaryngic Pathology*. The techniques were reprinted in the September-October 1956 issue of the TRANSACTIONS. We must have concerted action, at once, on the histopathologic front. If we do not do something about our lack of knowledge, too many ears throughout the world will be nonsalvagable because of our present uninformed, and often blind, methods of attacking the stapes.

We cannot advance in this micro-

orthopedic surgery without the study, the knowledge, and the skill which comes only from constant use of the long-focal-length microscope in the operating room and the high-power microscope in the laboratory.

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DISCUSSION

DOROTHY WOLFF, Ph.D., New York (*Read* by John R. Lindsay, M.D., Chicago): Dr.

Fowler's paper stresses the fracture of the stapes in otosclerosis and the necessity of reading every section in the otosclerotic petrosae.

I quite agree that every section must be studied in otosclerotic temporal bones, but every fracture that is seen may not have been a fracture during life. Cells filling in the fracture line, or organization of hemorrhage in the area or of other tissue, can alone prove this. On the other hand, the fracture might not have been done at autopsy or at operation but may have occurred too near the time of death for nature to have attempted repair. In my experience, although I have seen several fractures of the petrosae in otosclerotic cases, they have not occurred in the footplate, nor even in the site of the otosclerosis center.

Ankylosis of the stapes is an attempt on the part of Nature to repair diseased bone in the region of the oval window. In my experience, I have not received a temporal bone with a clinical diagnosis of otosclerosis that did not show bony ankylosis. Dr. Guild will recall the case in the Johns Hopkins collection of which I made cellophane reconstructions, drawing from every section, because the case showed histologic otosclerosis but an audiometer record taken shortly before death had not indicated otosclerosis. Fibrous tissue bearing flecks of calcium filled the niche of the oval window, but no calcium bridge was built from the otic capsule wall to the stapes.

Believing that no single etiologic factor will be found to be the cause of otosclerosis but that it is disease of the bone of whatever type when it happens to occur in the region of the oval or round window, I believe the histopathologic change will vary with the reaction of the individual patient to the lesion and the type of disease, whether this be a localized part of Paget's disease; a localized result of parathyroid tumor, pituitary tumor, thyroid tumor, or hemangioma; a part of Raynaud's disease or of Buerger's disease; a localized bone disease as a part of kidney blockage; vascular disease due to periarteritis nodosa or obliterative endarteritis; or simple local withdrawal of calcium due to lowered calcium in the serum or a shift of phosphorus metabolism. Recent reports in the Annals of the New York Academy of Sciences (vol. 64, article 3) indicate that the pathologists who study general bone diseases are finding overlapping microscopic pictures in the various bone diseases. This is also the case in otosclerosis.

(Slides) I wish to show two lantern slides, a low-power photomicrograph and a high-power one of the stapes of a white rat, with ankylosis in its early stage. This rat was processed by us from animals with induced lathyrism, which were fed by Dr. Lalich of the Pathology Department of the University of Wisconsin. We processed the whole head, so fracture of the stapes at autopsy would seem impossible. Three fractured stapides have been seen so far. (Slide) This is the only ankylosis, and to my knowledge it is the first ankylosis, recorded in experimental animals. More detailed reports of the multiple pathologic changes appearing in these animals will appear at a later date.

JOHN R. LINDSAY, M.D., Chicago: I have enjoyed Dr. Fowler's presentation regarding the pathologic changes which are seen at the stapes footplate in otosclerosis. Incidentally, Dr. Fowler includes in his text mention of a number of sections showing other types of fixation of the ossicular chain which may occur as the result of chronic inflammatory disease. I do not think that those are likely to be confused with otosclerosis, but they do belong to another chapter in the surgical treatment of impaired hearing, as we are now learning, chiefly from the work of Zoellner and Wullstein.

Dr. Fowler's collection, I am sure, corresponds to our own in that the great majority of temporal bones with otosclerosis that we secure in the laboratory do not show ankylosis. The great majority of the patients whose temporal bones reach our laboratory did not have hearing records. We have no record that they had impaired hearing. We do see various types of changes at the joint, varying amounts of fibrosis, and some calcareous deposits in the ligament, but there is a difference of opinion as to what change is necessary at the footplate to produce a hearing loss.

From clinical experience it has been my opinion that you can develop a hearing loss before bony ankylosis occurs, but we will have to get many more sections from temporal bones accompanied by accurate hearing records before we are able to settle this question.

Dr. Fowler proposes a very interesting hypothesis as to the way in which we are able to secure mobility of the stapes. I had occasion to present a number of slides at the meeting in Montreal this Spring, and there I drew freely from the literature to show the different types of ankylosis that we may encounter. These have a direct bearing on the practical problem of mobilization.

One or two points regarding mobilization may be worth mentioning here.

There is a group of cases in my series of mobilizations in which the patient evidenced a definite hearing improvement while on the operating table. This improvement lasted for perhaps a few days, or even a month or two, and then the hearing dropped back to the preoperative level. This, to me, is explainable only in one way; that is, that we had broken through a spongy active otosclerotic focus, in which case there is more likelihood of callus formation and recurrence of ankylosis. If this were a fracture through the footplate and the footplate did not unite, we would not expect to have a recurrence of impairment of hearing so soon.

Another clinical observation that has always bothered me is that when a mobilization of the stapes is done even under microscopy, as I do all of them, it is very difficult to get such a good view of the footplate that you can be absolutely sure whether the whole footplate has been mobilized. On the other hand, now I do not use the typical maneuver that Dr. Rosen first described; I mobilize more often from the posterior surface of the head or neck of the stapes. Then when the stapes comes loose, it does not do so as suddenly, as a general rule; it comes loose rather slowly. With repeated very gentle manipulation it gradually comes loose. That, coupled with the fact that as far as I can see with the microscope the whole footplate comes loose, makes me think that in my successful cases I must have gone through the otosclerotic focus rather than the footplate.

I am willing to admit that it might be a very good way to get the more severe cases of fixation broken loose, to break through or cut one crus and then fracture the footplate.

I showed in Montreal slides illustrating one case of Dr. Guild's in which the fixation occupied at least two thirds of the circumference of the footplate. We have no way of knowing when we start whether the stapes will be fixed anteriorly or posteriorly or in between.

Another important point to realize is that at the present time the majority of cases we see are of two types: the very early cases in which there is no fixation and a number of examples of extreme fixation in which nothing in the world could be expected to get the stapes loose. Both in the very advanced cases and in the very active cases, there is probably not a very good prospect that an attempt at mobilization will be successful.

SOME MEDICAL IMPLICATIONS OF THE 1954 WISCONSIN STATE FAIR HEARING SURVEY

ARAM GLORIG, M.D.
LOS ANGELES, CALIFORNIA

THE importance of medical histories in the diagnosis of otologic diseases is unquestioned, but until recently no large-scale attempt had been made to evaluate the significance of the relation between items ordinarily included in such histories and the measured auditory threshold. Unfortunately, it is not possible to make such an evaluation from the office and clinical records that are generally available. In order to determine whether or not there is a statistically significant relation between the magnitude of a person's hearing loss and items such as history of aural disease, certain stringent conditions of data collection must be met. For example, all subjects must be examined and tested under the same conditions, interviews must be well organized so that the uniformity of questions and questioning techniques can be controlled, and large numbers of persons must be tested so that statistical techniques can be applied in the analysis of the data.

Large-scale hearing surveys provide an excellent opportunity for the realization of these testing and questioning conditions. There have been several such surveys in the United States, beginning with the United States Public Health Survey of 1935 and 1936. This survey included a comprehensive medical history and an otologic examination, but there has been no widespread publication of the results of an analysis of the relations between measured hearing loss and medical findings. Other large surveys, notably the World's Fair Hearing Survey in 1939 and the San Diego County Fair Survey in 1948, did not include a medical examination or record of medical history. Recognizing the importance of making a statistical analysis of otologic history items, the staff of the Research Center of the Subcommittee on Noise in Industry planned the procedure of the Wisconsin State Fair Hearing Survey to include the necessary examination and interviews with proper controls.

PROCEDURE USED IN THE WISCONSIN STATE FAIR HEARING SURVEY

The Wisconsin State Fair Hearing Survey was conducted on the state-fair grounds at Milwaukee, Wisconsin, in August 1954. Some 3,500 people attending the fair (1,741 males and 1,724 females) participated in the survey. The interviewing and testing procedure consisted of four separate steps.

First: Medical History and Otologic Examination

An experienced otologist obtained a brief otologic history of each subject and examined his or her ears for evidence of aural disease. The interview and the examination both were conducted according to a prespecified plan. Results of both were recorded on a single printed form.

Director, Research Center, Subcommittee on Noise in Industry.

Presented at the *Special Program* of the Otosclerosis Study Group and the Committee on Conservation of Hearing of the American Academy of Ophthalmology and Otolaryngology, Oct. 14, 1956, Chicago.

Second: Personal History

A personal history, including place of residence, date of birth, and general noise-exposure information, was obtained on a prepared form filled out by each respondent.

Third: Nonmedical History

This history, which is not of particular interest to us here, was concerned mainly with the occupational life of the subject. Specific information about military service, factory or farm noise-exposure, etc., was obtained during an interview conducted by specially trained persons.

Fourth: Auditory Tests

Pure tone air conduction threshold tests and speech reception threshold tests were given. Pure tone auditory thresholds were measured at 500, 1000, 1500, 2000, 3000, 4000, and 6000 cycles per second. The tests were made with Maico H-1 audiometers. Speech reception thresholds were measured for recorded spondee words. These tests were given with U. S. Recording Company speech audiometers and Central Institute for the Deaf W-1 recorded spondee word lists.

OTOLOGIC HISTORY AND AURAL EXAMINATION

In order to obtain as much information as possible in the limited time allotted to each subject, a highly organized routine was prescribed for the medical interview and examination. Only answers to specially selected questions were recorded, and a limited number of physical findings were reported. The prepared form used in this part of the survey is reproduced in figure 1. Notice that immediately after entering the name and address, we asked for the subject's age in years. We had been warned not to expect a truthful answer to this question, and we were prepared to cross check the ages given here with the date of birth, which was requested on the personal history form. We assumed that if the respondent were interviewed by a physician at the start, he or she would be more willing to answer such questions as "Where do you live?" and "How old are you?," but we felt the cross check was necessary. Either our assumption was correct or the statement that respondents would not answer such questions truthfully was unfounded. All ages given were consistent with the recorded birth date. Incidentally, out of 3,500 persons tested only two (women) raised any objections to telling their age, and one of them eventually complied.

Medical history items were explored thoroughly by relevant questions before an answer to 1.3, 1.4, or 1.5 on the examination form was recorded. If, for example, a subject indicated that he had had ear trouble, the otologist was instructed to determine specifically what the trouble had been, when it occurred, how long it had lasted, and how severe it had been. When the examining physician was satisfied as to the validity of the respondent's reply, it was recorded accordingly.

It is well known by experienced interviewers and by persons who have worked with questionnaire data that subjects frequently misunderstand a question the first time it is asked, and that if a first answer is accepted without further questioning, considerable misinformation may be obtained. Because of this, we were careful to have experienced physicians conduct the medical interviews. More than 85 per cent of the respondents were interviewed and examined by experienced otologists. Experienced general practitioners served as relief examiners. We are confident that the medical records are as accurate as they can possibly be under survey conditions.

Part 1. No. 4014

PHYSICIAN'S EXAMINATION

DATE: August....1954

1.1 NAME .....
ADDRESS .....

1.2 AGE .....

1.3 Have you ever had any trouble with your ears?
1. Earaches—
2. Draining or running ears—
3. Injuries—
4.

1.4 Have you ever had any trouble with your nose or throat?
1. Sore throats—
2. Tonsils out—
3. Nose operations—
4. Frequent colds—
5.

1.5 Have you ever had any hard blows to your head?
1. Were you unconscious—
2. Bleeding from ears—
3. Skull fracture—
4.

1.6 Is your hearing GOOD.....FAIR.....POOR.....

1.7 Does anyone in your family or a close relative have hearing loss? If yes, how old was he or she when the hearing loss started?

1.8 Why are you interested in having your hearing tested? .....
.....

A. Canal—patent R L
B. Cerumen—plus R—1 2 3 4 L—1 2 3 4
C. Perforations—Healed Patent R L R L
D. Discharge—R L
E. Evidence of disease of drumhead—1. Normal .....R L
2. Scars .....R L
3. Adhesions .....R L
4. Retractions .....R L

FIG. 1—Otologist's Examination Form.

The information obtained during the examination and interviews, and the measured values of auditory thresholds were recorded in such a way as to be readily coded and transferred to punched cards for machine analysis. These data were analyzed to find, among other things, what relation, if any, existed between (a) the measured auditory thresholds and (b) the various items in the medical record. The results of this analysis are discussed under the heading "Medical Implications."

MEDICAL IMPLICATIONS

A breakdown of the responses to questions on the otologist's examination form and percentage lists of the physical findings are reported in table I. One item which is of general interest, even though it was not included in the statistical analysis, is "Reported trouble with nose and throat." Note that 66 per cent of the males and 70 per cent of the females reported difficulty with the nose and throat. Of these, only 20 per cent of the men and 27 per cent of the women reported having had sore throats, but 46 per cent of the men and 50 per cent of the women had had tonsillectomies.

For purposes of analysis, the information obtained from the otologist's examination has been divided into five categories:

A. Reported trouble with ears
B. Reported blows to the head

TABLE I

PERCENTAGES BY SEX OF PERSONS INTERVIEWED WHO HAD A MEDICAL HISTORY CONDUCIVE TO EAR DISEASE OR WHOSE OTOLOGIC EXAMINATION GAVE EVIDENCE OF EAR DISEASE (AGES 10 TO 79)

MEDICAL HISTORY	M	F
Had trouble with ears	27.0	28.0
Earaches	8.2	11.7
Draining or running ears	12.5	13.2
Injuries	12.3	9.3
Had trouble with nose or throat	65.8	69.7
Sore throats	20.4	27.4
Tonsils out	46.4	50.6
Nose operations	7.8	4.1
Frequent colds	19.4	17.1
Had hard blow to the head	23.5	11.6
Unconscious	15.2	6.8
Bleeding from ears	0.4	0.2
Skull fracture	2.1	1.0
Close relative has a hearing loss	15.3	21.3
PHYSICAL EXAMINATION		
Canal not patent	0.9	0.5
Cerumen plus 1	2.8	2.8
Cerumen plus 2	5.6	4.3
Cerumen plus 3	5.7	3.5
Cerumen plus 4	11.3	6.4
Perforations	4.8	3.8
Healed	3.2	2.4
Patent	1.6	1.3
Discharge from ear	0.8	0.3
Diseased drumhead	12.5	9.0
Scars	8.0	4.6
Adhesions	1.1	1.2
Retractions	8.1	5.7
Number of persons tested	1741	1724

C. Family history of hearing loss
D. Subject's estimate of hearing ability
E. Physical findings

We wish now to discuss the data from which the percentage figures in table I were compiled, and to estimate the statistical significance of assumed relations between measured hearing loss for an individual and the five items listed above.

A. Reported Trouble with Ears

Twenty-seven per cent of the men and 28 per cent of the women reported "trouble" with ears. To learn whether or not reported trouble with ears can be taken to mean that a resulting hearing loss has occurred, we compare the median hearing loss for the group that reported trouble to the median hearing loss for those who reported no trouble. A sample of these median losses is given in table II. In the interests of brevity, losses are reported at two frequencies only, 1000 cycles per second and 4000 cycles per second: 1000 cycles per second because it is typical of the range of frequencies important for hearing speech, and 4000 cycles per second because it represents the region at which many hearing losses first appear. To se-

TABLE II

MEDIAN HEARING LOSS IN DECIBELS FOR MEN AND WOMEN WITH HISTORY OF EAR TROUBLE AND FOR MEN AND WOMEN REPORTING NO EAR TROUBLE

FREQUENCY	SEX	AGE	TROUBLE	NO TROUBLE	NUMBER TESTED
1000	M	20-29	5.6	3.3	66; 236
		30-39	9.5	4.8	68; 246
		40-49	11.4	9.6	66; 212
		50-59	16.7	11.6	67; 231
	F	20-29	1.8	0.2	63; 232
		30-39	7.0	2.5	66; 226
		40-49	7.0	4.8	87; 251
		50-59	8.9	8.5	62; 231
4000	M	20-29	16.4	13.6	66; 236
		30-39	31.9	31.2	68; 246
		40-49	42.5	43.8	66; 212
		50-59	53.4	54.0	67; 231
	F	20-29	11.4	7.3	63; 232
		30-39	15.5	11.4	66; 226
		40-49	18.8	14.9	87; 251
		50-59	26.7	23.9	62; 231

cure these median values, the data on men and on women were considered separately and were subdivided into age groups with a ten-year span. Differences between median thresholds of the trouble and no-trouble groups range from 0.4 to 5.1 decibels. In general, the auditory threshold is higher for the group reporting trouble with the ears. It is well known that there is some variability in audiometric measurements, and the question to be answered now is: Are these differences statistically significant or could they have occurred by chance? The test of significance is, in essence, a test of the validity of the hypothesis that persons who reported ear trouble have greater hearing losses than persons who reported no ear trouble. Of the sixteen sets of median thresholds compared in table II, differences for seven were found to be not significant. That is, chance could account for the differences, and for these persons the hypothesis was not proved to be correct. Five of the differences were found to be significant at the 5 per cent level. That is, the probability of so great a difference in threshold arising by chance is 5 per cent. It is reasonable to conclude that these differences are probably significant. In the four remaining pairs, the difference is significant at the one per cent level. That is, only once in 100 similar studies would such differences in threshold be due to chance. From these tests of the statistical significance of threshold differences between the trouble and no-trouble groups it appears that in a sample of the general population such as the one tested at the Wisconsin State Fair Hearing Survey, reported trouble with the ears does not necessarily mean, and cannot in the majority of cases be interpreted to mean, that a hearing loss resulted from the ear trouble.

B. Reported Blows to the Head

Twenty-three per cent of the males and 11 per cent of the females reported that they had received a hard blow to the head. Of these, 15 per cent of the males and 7 per cent of the females had sustained head blows severe enough to cause unconsciousness. These respondents were questioned about unconsciousness for a specific reason. I have often wondered if there were some relatively simple way to determine just how hard a blow to the head had to be to produce

a hearing loss. It is well known that blows severe enough to cause skull fracture can cause a hearing loss. It seemed reasonable to assume as a first approximation that if enough concussion to bring about a state of unconsciousness resulted from a blow, that blow had been severe enough to produce a hearing loss. This analysis was made partly to check the validity of that assumption.

Graphical representations of thresholds for persons who reported blows to the head with unconsciousness and for those who reported no blows to the head are shown in figures 2 and 3. Data for

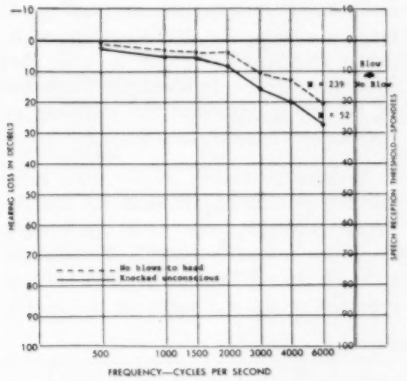

FIG. 2—Median hearing loss (left ear only) for men 20 to 29 years of age who have been knocked unconscious, and for those who have never received a hard blow to the head.

all ten-year age groups were analyzed, but, again in the interests of brevity, results are reported for only two age groups: 20-29 years and 40-49 years. Notice that for the 20-29 group (fig. 2) there is a consistent difference between the two curves, suggesting that subjects who report head blows with unconsciousness have more hearing loss. This consistent difference appeared for all comparative ten-year age groups except the 40-49 group (fig. 3). On the basis of

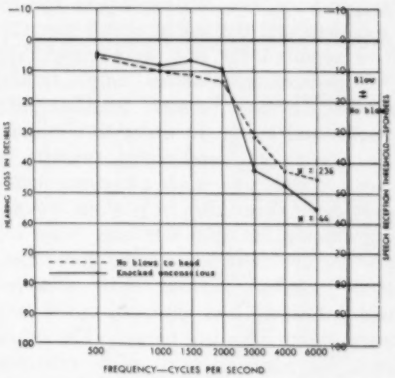

FIG. 3—Median hearing loss (left ear only) for men 40 to 49 years of age who have been knocked unconscious, and for those who have never received a hard blow to the head.

these consistent differences, one might conclude that when a patient reported a hard blow to the head with unconsciousness, it would be fairly safe to assume that he would demonstrate a resulting hearing loss. It is not so. In this study, even though most cases reporting head blows with unconsciousness showed more hearing loss than those who reported no blows to the head, the differences were found to be statistically not significant.

I have always considered that if a head blow did not produce unconsciousness, it was not severe enough to cause a hearing loss. Apparently, at least until there are more data available for analysis, I must also consider that unconsciousness as the result of a head blow is not an indication of resulting hearing loss. We are still without an answer to the questions, "Just how hard must a blow to the head be to produce a hearing loss?" and "How do we evaluate the patient's report of a head blow in relation to existing hearing losses?"

C. Family History of Hearing Loss

If there was a history of hearing loss in a member of the family of any of the

respondents, the relationship to the respondent and the age at which the relative acquired the loss were noted. We included close relatives only: father, mother, brother, sister, grandparents, uncles and aunts. In order to eliminate the effects of presbycusis present in older relatives, we made a two-part comparison of thresholds in persons reporting familial hearing loss and those reporting no familial hearing loss. One part included persons with relatives whose hearing loss appeared when they were under 50 years of age. The other part included persons with relatives whose hearing loss occurred when they were over 49 years of age. As before, thresholds are reported at 1000 cycles per second and 4000 cycles per second (tables III and IV). Even though 37 per cent of the total group reported hearing loss in close relatives, there is only one statistically significant threshold difference; namely, that at 4000 cycles per second for the males in the age range from 50 to 59 years (table IV).

This unexpected lack of relation between family history of hearing loss and measured hearing loss in the respondents is probably due to the relative rarity of congenital hearing loss in a general population sample such as the Wisconsin State Fair Survey group.

D. Subject's Estimate of Own Hearing Ability

You will recall that subjects were asked to evaluate their hearing as good, fair, or poor. Note specifically the way the question on hearing evaluation was phrased. The respondent was given a choice of descriptive classifications in which to place himself. We did not ask him to tell us what he thought about his hearing. He was required to make only the judgment good, fair, or poor. We accepted no other answers, and no qualifications were recorded. This method of

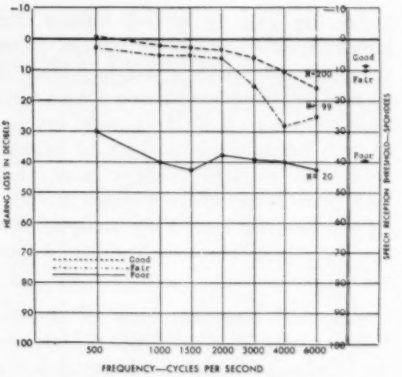

FIG. 4—Median hearing loss (right ear only) for men 20 to 29 years of age who reported that their hearing was good, fair, and poor.

questioning relieved the respondent of making a judgment of his hearing without a standard on which to base that judgment, and it relieved the examiner of having to interpret the meaning of respondents' answers.

Median thresholds for the three self-selected groups (again only for the 20-29 age range and the 40-49 age range) are given in figures 4 and 5. The median spondee speech reception threshold is reported at the far right of the graph.

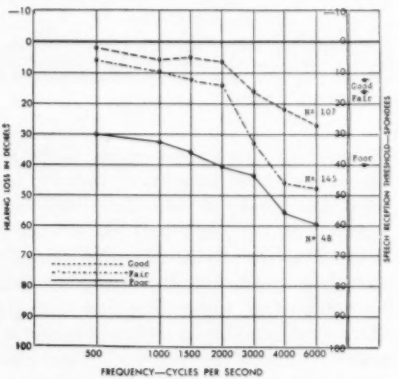

FIG. 5—Median hearing loss (right ear only) for men 40 to 49 years of age who reported that their hearing was good, fair, and poor.

TABLE III

MEDIAN HEARING LOSS IN DECIBELS FOR MEN AND WOMEN REPORTING MEMBER OF FAMILY UNDER 50 YEARS OF AGE WITH HEARING LOSS AND FOR MEN AND WOMEN WHO REPORT NO HEARING LOSS IN FAMILY

FREQUENCY	SEX	AGE	NO LOSS	WITH LOSS	NUMBER TESTED
1000	M	20-29	3.5	2.0	256; 22
		30-39	5.1	6.4	263; 17
		40-49	9.5	9.4	218; 15
		50-59	12.5	10.0	252; 14
	F	20-29	0.3	2.2	221; 29
		30-39	3.5	7.5	221; 18
		40-49	5.5	5.5	239; 26
		50-59	9.1	7.5	203; 18
4000	M	20-29	14.6	15.0	256; 22
		30-39	31.4	28.8	263; 17
		40-49	41.7	35.0	218; 15
		50-59	54.2	52.5	252; 14
	F	20-29	8.2	8.3	221; 29
		30-39	12.4	20.8	221; 18
		40-49	15.8	19.2	239; 26
		50-59	24.2	25.0	203; 18

TABLE IV

MEDIAN HEARING LOSS IN DECIBELS FOR MEN AND WOMEN REPORTING MEMBER OF FAMILY OVER 49 YEARS OF AGE WITH HEARING LOSS AND FOR MEN AND WOMEN WHO REPORT NO HEARING LOSS IN FAMILY

FREQUENCY	SEX	AGE	NO LOSS	WITH LOSS	NUMBER TESTED
1000	M	20-29	3.5	4.7	256; 25
		30-39	5.1	4.3	263; 38
		40-49	9.5	8.2	218; 36
		50-59	12.5	11.9	252; 36
	F	20-29	0.3	0.3	221; 28
		30-39	3.5	3.8	221; 43
		40-49	5.5	5.5	239; 59
		50-59	9.1	6.0	203; 57
4000	M	20-29	14.6	16.2	256; 25
		30-39	31.4	30.5	263; 38
		40-49	41.7	42.5	218; 36
		50-59	54.2	39.2	252; 36
	F	20-29	8.2	5.5	221; 28
		30-39	12.4	14.6	221; 43
		40-49	15.8	18.0	239; 59
		50-59	24.2	22.1	203; 57

For both age groups there is a distinct separation of median threshold values at all measured frequencies. Those who reported their hearing "good" have the "best" median audiogram. The group labeled "fair" has a slightly higher threshold from 500 to 2000 cycles per second inclusive, and this group shows an increasingly greater loss than the "goods" show at frequencies above 2000 cycles per second. Spondee speech reception thresholds for the two groups were between 5 and 15 decibels. Those who labeled themselves as poor hearers had a median threshold audiogram that was entirely above 30 decibels. The speech reception threshold was 40 decibels above normal.

The largest threshold differences between good and fair hearers lie in the region above 2000 cycles per second. The spondee speech reception thresholds for the two groups are about the same. This is to be expected. From recent studies of predicting speech reception thresholds from measured pure tone thresholds,[1,2] it is known that hearing loss for speech, for both spondee and PB (phonetically balanced) word lists, can be predicted with reasonable accuracy from the measured hearing loss for pure tones between 500 and 2000 cycles per second inclusive. We can speculate, then, that the difference between fair and good hearing may be a difference not so much in hearing for speech as in hearing for high-pitched sounds: the telephone ring, the canary's singing, etc. The differences in threshold between the good and fair groups are all statistically significant at the one per cent level. Although these differences are statistically significant, it is known from clinical studies that threshold differences of this amount, about 5 decibels, do not (at this threshold level) make a difference in the ability to communicate by speech. A word of caution is in order here. Although these differences exist, and although they are *statistically* significant, they are not necessarily significant to speech reception. It is important to remember that a statistically significant difference need not be a functionally significant difference. Failure to recognize that an interpretation of statistical significance is always in order has led to many mistaken conclusions. There are experimenters who, eager to prove a point, tend to use statistics as the proverbial drunk uses a street lamp —more for support than for light.

E. Physical Findings

The otologic examination included only an inspection of the external ear and an otoscopic examination of the drumhead. Evidence of aural disease was limited to such findings as congenital malformations of the ear, perforations, scars, adhesions, retraction of the drumhead, and presence of discharge from the middle or external ear. Thirty-two per cent of the total group showed evidence of past disease; only 1.1 per cent had any evidence of active disease at the time of examination.

Median thresholds for persons with and without evidence of aural disease are given in table V. Only five of the sixteen differences in threshold are statistically significant. Of these five, only two are significant at the one per cent level. It appears that such evidence of aural disease is even less reliable as an indicator of hearing loss than is reported trouble with the ear. It must be remembered, of course, that evidence of aural disease was limited to evidence found during examination of the external ear, and to the otologist's judgment of just what constituted aural disease.

In summary, we can say that in a general population sample such as the sample studied at the 1954 Wisconsin State Fair Hearing Survey, (a) reported ear trouble, (b) reported familial hearing loss, and (c) evidence of aural disease of the external ear or the drumhead are *not* reliable indicators of hearing loss. Also, hard blows to the head with resulting unconsciousness are apparently not more productive of hearing loss than are hard blows to the head without unconsciousness. And lastly, if a respondent is asked to describe his hearing as good, fair, or poor, the judgment may be used as a reliable indicator of high frequency loss or general hearing loss greater than 30 decibels.

CONCLUSIONS AND RECOMMENDATIONS

There are two major conclusions to be drawn from this analysis of data collected at the 1954 Wisconsin State Fair

TABLE V

MEDIAN HEARING LOSS IN DECIBELS FOR MEN AND WOMEN WITH EAR DISEASE AND FOR MEN AND WOMEN WITH NO EAR DISEASE

FREQUENCY	SEX	AGE	DISEASE	NO DISEASE	NUMBER TESTED	
1000	M	20-29	4.6	3.6	51;	268
		30-39	7.4	5.1	73;	274
		40-49	15.9	8.8	69;	282
		50-59	23.8	10.9	77;	242
	F	20-29	—0.3	0.6	30;	279
		30-39	5.7	3.4	54;	259
		40-49	7.3	5.4	49;	313
		50-59	9.6	8.5	44;	270
4000	M	20-29	15.4	14.4	51;	268
		30-39	36.2	30.8	73;	274
		40-49	47.9	42.5	69;	232
		50-59	55.4	53.4	77;	242
	F	20-29	8.3	7.9	30;	279
		30-39	16.0	12.1	54;	259
		40-49	24.6	15.6	49;	313
		50-59	25.5	24.3	44;	270

Hearing Survey.

First: Physicians cannot expect otologic histories and physical findings to be reliable indicators of hearing loss. There is as yet no substitute for the measurement of auditory thresholds.

Second: Valid conclusions about the effects of therapeutic measures cannot be drawn from measured changes in the auditory threshold unless it is demonstrated that those changes are statistically significant.

If a physician expects to use his records as a source of data from which to draw general conclusions, he must institute record-taking and record-keeping systems that will provide uniformity and control. For example, interviews should be conducted with a standard set of questions. There should be explicit and detailed instructions for interviewers. Interviewers should be impressed with the importance of keeping questioning procedures as uniform as possible. It is wise to ask for as much pertinent information from the subject as it is practical to obtain; probably *more* information than you think you need. This last recommendation applies particularly to teaching institutions that have an otologic service. Adequate records from such institutions could be invaluable in studies of the labyrinth or large scale studies of tinnitus. Unfortunately, most of the available records are incomplete in these areas or are so highly nonuniform as to be unacceptable.

On the basis of this preliminary report, I think it is safe to say that many of us have assumed and reported that certain benefits were due to various surgical and medical procedures when, in fact, the changes that indicated benefits could well have been due to chance.

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1. Harris, J. Donald: Personal communication.
2. Quiggle, R.; Glorig, Aram; Delk, J., and Summerfield, A.: Predicting hearing loss for speech from pure tone audiograms, Laryngoscope (in press).

DISCUSSION

MEYER S. FOX, M.D., Milwaukee, Wisconsin: I welcome this opportunity to discuss Dr. Glorig's presentation on the medical implica-

tions of the 1954 Wisconsin State Fair Hearing Survey. The hearing surveys of 1954 and 1955 were the direct result of the large number of claims for industrial compensation that arose in the state of Wisconsin. Over five hundred such claims for alleged loss of hearing due to industrial noise exposure were filed with the Commission. Many thorny medical-legal questions had arisen in connection with these cases, and industry and labor were seeking answers to the problem of hearing loss as it occurs in the general population. Wisconsin was particularly well suited for these investigations, inasmuch as the state represents an equal balance between city and farm populations.

In the testimony which accompanied the claims for occupational hearing loss, many of the opinions expressed by physicians were based upon possibilities, speculation and so-called "educated guesses." It was hoped that the Wisconsin State Fair Hearing Surveys would do much to establish the facts and eliminate unnecessary speculation.

Dr. Glorig's report does not deal with such interesting and disturbing problems as presbycusis, hearing loss in industrial workers with history of military service as compared to workers with nonmilitary history, hearing status of farm workers as compared to city industrial workers, and reliability of the zero threshold as a basis for hearing curves recorded with present-day audiometers. Preliminary reports on the Wisconsin State Fair Hearing Survey have been published in the magazine *Noise Control* for November 1955, and undoubtedly other reports will follow.

In summarizing, Dr. Glorig stated that a history of ear trouble, a report of hearing loss in other members of the famliy, and evidence of aural disease of the external ear or drumhead were not reliable indicators of the hearing loss. He also concluded that blows to the head hard enough to result in unconsciousness did not produce any more hearing loss than hard blows to the head without unconsciousness. The conclusion that the response of the subject as to whether his hearing is good, fair or poor is a reliable indicator of a high frequency loss or of a general hearing loss greater than 30 decibels is in line with observations commonly made in everyday otologic practice.

I was particularly interested to note Dr. Glorig's statement that hearing loss for speech for both spondee and PB (phonetically balanced) words can be predicted with reasonable accuracy from the measured hearing loss of pure tone air conduction studies, using the frequencies between 500 and 2000 cycles per second inclusive. In the state of Wisconsin our Medical Advisory Committee to the Industrial Commission has recommended that an average of the three frequencies 500, 1000 and 2000 cycles per second be used for determining hearing disablement. By means of a table, the average of these three frequencies is then converted into percentages of hearing disability.

The conclusion that physicians cannot expect otologic histories or physical findings to be reliable indicators of the hearing loss should be underscored and printed in bold type. I agree that there are no substitutes for accurate records and careful measurement of auditory threshold. The lesson to be learned from this survey is that management and labor must realize that it is necessary to obtain at the time of employment a proper history and accurate measurements of the auditory threshold of workers who will be exposed to noise or who will be subject to traumatizing forces, whether it be direct blows or acoustic trauma. These records of hearing threshold should be used to compare a worker's hearing to known standards, and subsequently to serve as a base line against his own hearing records taken at periodic intervals.

A lot of careful planning and hard work went into this project. I congratulate Dr. Glorig and his staff on a job well done.

HALLOWELL DAVIS, M.D., St. Louis: I am very happy to have an opportunity to add my comments to those of Dr. Fox on this presentation by Dr. Glorig, because I want to emphasize, first of all, of what tremendous value this Wisconsin State Fair Hearing Survey is proving to be.

The body of data that was collected there, under the very excellent conditions worked out by Dr. Glorig, many assistants and associates is unique in the annals of otology. This is just a sample of the many studies that are going to be based on this body of data, and here, as in perhaps many of the others to come, there were some surprises.

Secondly, let me say "amen" to the need for studies, now that data are available, of a hard-boiled statistical sort to test out the many unavoidable clinical impressions that we all form as we see patients and as we read the literature. In his concluding remarks, Dr. Glorig pointed to a similar need for the validation of certain therapeutic measures.

Dr. Glorig's second conclusion actually is a pretty good statement about "validation."

He says, "Valid conclusions about the effects of [whatever it may be] cannot be drawn from measured changes . . . unless it is demonstrated that those changes are statistically significant." In other words, a trend that looks plausible does not constitute a demonstration of something which we think may be so or which we wish might be so, or proof that a hypothesis really is correct. The notion of validation means putting our idea to a rigid test and comparing it to some other external standard which we agree to, and preferably agree to in advance.

I only wish that, in addition to testing therapeutic measures, we could apply this kind of validation to other things, such as the question of success in fitting hearing aids. Does it really make a difference whether we go through the "fitting" procedures? I think much of this is mumbo jumbo, although it is done in the name of producing a scientifically correct "best fit." I wish we could validate that one!

Now getting back to Dr. Glorig's remarks, I was interested in the results obtained on the analysis of the self-judgment of the persons tested regarding their hearing. You will remember that this is one thing that really stands out as statistically significant. The boundary line of where the patients on the average said their hearing was "poor" turned out to be in the neighborhood of 30 decibels hearing loss over the speech frequencies. This 30 decibels loss is turning up again and again, and it is of great importance in determining what we mean by "disability of hearing." As a result of this study, we can now say that, on the average, when people say that they have "poor hearing," this is the kind of thing they mean.

The composite audiograms also gave me for the first time a concept of what people do mean by "fair hearing." They mean that they are not really having trouble, they are getting along all right, but they notice that something is wrong. They are missing something, they are aware of it, but they are not disabled. Here it is a loss, not in the essential speech frequencies but in the high frequencies. The way that the composite audiogram falls off above 2,000 is really impressive. Thus we now have for the first time a clear concept in terms of the audiogram to attach to this everyday concept of "fair," and this is another major contribution.

I like the way Dr. Glorig wound up his paper. First he gave a summary of the facts as he had found them. Then he had another section which he called, "Conclusions and Recommendations." He pointed the moral and orned the tale. He took the findings and made a compilation from them of certain other more or less similar situations, combining the new facts and trends with his own experience and judgment. In a clinical paper, the combination of new facts with the seasoned judgment of the expert is often the most interesting and valuable part.

But actually I do not call that a "summary." I would even question whether or not it ought to be called "conclusions." What Dr. Glorig did was to discuss his own paper: to discuss it just as I have been privileged to do, extrapolating from the trends to certain other things that happen to interest me. And since in a discussion a matter of opinion is in order, I will say that I am happy to agree with the opinions Dr. Glorig gave us in his discussion.

THE PROBLEMS OF GERIATRIC OTOLOGY

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OLDER individuals with hearing difficulty present a problem which to date has been treated with relatively little success by the clinical otologists. Such individuals present a picture that differs from that found in younger individuals. In addition to the classic forms of hearing impairment, these people suffer from organic degenerative changes along the neuroauditory pathways, and from an altered psychological outlook. Such neurological and psychological changes reduce the prospects for satisfactory rehabilitation except by the most painstaking methods.

Elderly persons with impaired hearing develop a negative attitude. They come to the otologist expecting to be told that nothing can be done to help them, and they are mentally prepared to accept such a statement. They already believe that the hearing loss will progress, in spite of every effort, to the stage of an incapacitating handicap.

Otologists, for the most part, have not seriously faced the problem presented by this group of patients. Even when the mental attitude of such a patient is recognized, only a superficial attempt is usually made to combat its unfavorable effect on prognosis. The tendency is to accept the patient's dismal expectations. With this attitude on the part of the otologist, nothing constructive and helpful to his patient can be accomplished.

It should be realized that such patients actually face far more than a hearing loss. Theirs is a problem of communication. They have already lost the will to try to overcome their handicap. Many such patients react by going into seclusion. They are much more handicapped than are children with similar degrees of hearing impairment.

As the life expectancy of our population has gone up, the number of elderly persons with serious communicative problems has also increased. The numerical size of this component of our population is unknown, but certainly it is high time that careful thought be given to measures that may help its members retain the ability to communicate effectively with other persons.

The hearing impairments of old age may be broadly grouped and characterized as (1) conductive, (2) receptive, and (3) perceptive. The organic lesions that cause severely impaired hearing in elderly persons result from the accumulations and the degenerations of a lifetime; seldom is the functional loss due to a single lesion.

1. The common causes of conductive impairments in elderly persons, as in younger ones, are (a) middle-ear lesions that have resulted from the reactions to previous local infections and (b) otosclerosis. Although these lesions have usually existed for many decades, it is only in old age, after other lesions and factors develop, that their full effect on hearing acuity causes a serious handicap.

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Presented at the *Special Program* of the Otosclerosis Study Group and the Committee on Conservation of Hearing of the American Academy of Ophthalmology and Otolaryngology, Oct. 14, 1956, Chicago.

2. The lesions that result in what is here termed a receptive impairment are in the cochlear part of the peripheral endorgan of hearing. The common lesions here are (a) atrophy of the organ of Corti in part or in all of the basal turn, and (b) partial atrophy of the cochlear nerve, with or without an associated atrophy of the organ of Corti. Among the etiologic factors that may cause such lesions are exposure to noise of high intensity, vascular disorders that interfere with the cochlear blood supply, and the effects of toxic substances such as quinine and dihydrostreptomycin.

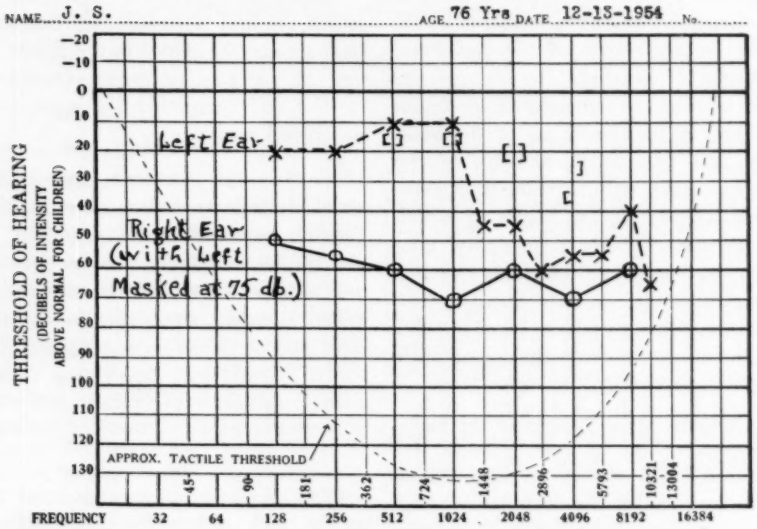
3. Degenerative changes in the higher centers of the auditory part of the central nervous system are believed to be responsible for the form of hearing impairment here characterized as perceptive. The perceptive form of hearing impairment differs so much from the other varieties of nerve deafness that it's manifestations deserve to be classified separately, as a group equal in status to conductive impairments. To accord perceptive impairments such recognition should speed up the proper care of patients who have this serious condition.

Clinically, patients with a perceptive impairment have marked difficulty in the rapid analysis of complicated sequences of sounds. These are the people who hear but can't understand speech in any complicated listening situation. Hearing tests show discrimination to be extremely poor when tested under stress, and there is a much greater spread than normal in sound level between hearing a word and understanding it. Many of these people appear to have a normal endorgan of hearing. They reject a hearing aid because of its loudness. Often a close association seems to exist between the perceptive hearing impairment and other signs of cerebral sclerosis (figs. 1, 2, 3).

Classification of types of hearing loss is but the first step. In order that these patients may be helped to the fullest extent of our meager armamentarium, a careful and comprehensive study must be carried out.

A thorough otologic examination should include an audiologic evaluation. Special emphasis must be placed on, and special techniques used to evaluate, the whole problem of communication. When possible, the patient's listening environment should be investigated. The patient should also undergo a careful medical survey, with vascular and other processes carefully scrutinized for signs of degeneration.

With all the information at hand, the patient and, if possible, the patient's family should be met with. The complete assessment of the patient's hearing problem, of his medical problem, and of their interrelation should be placed before the family group. Every effort should be made to create a thorough understanding of the limitations of, as well as the possibilities for, rehabilitation. If amplification seems indicated, special sessions should be arranged with the audiologist for selection of an aid and instruction in its use. The patient must realize the problems related to amplification. Those patients with fairly stable hearing, who are able to get sufficient help from amplification to make the hearing serviceable, would do better to study phonetics than lip reading. Long periods of lip reading without sound are extremely tiresome and do not produce results commensurate with the effort. Lip reading should be undertaken, however, by those people with sudden onset of crippling hearing loss, or with definite rapid deterioration of hearing. An effort should be made to improve the listening situation both at home and in the place of business, using improved lighting and



Thresholds measured by PGSR audiometry were essentially the same as those obtained by the standard method, shown above.

SPEECH AUDIOMETRY

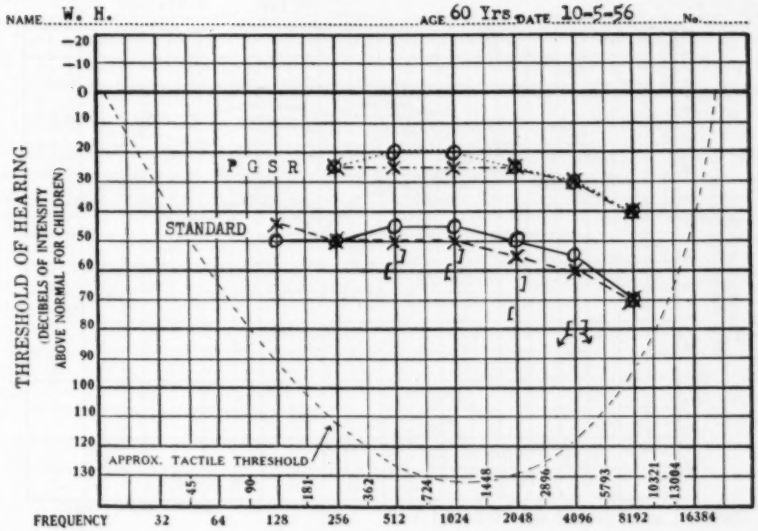
Test Condition	"Hearing Thresholds"	Discrimination Score
Free Sound Field	20 Db.	80 %
Left Ear	20 Db.	80 %
Right Ear	64 Db.	96 %
Aid on Right Ear	12 Db.	96 %

FIG. 1—The hearing tests of a 76-year-old man, who for 64 years has had a severe conductive impairment (due to otitis media) of the right ear. Until eight years ago his left ear was good, then a progressive inner-ear type of impaired hearing began. Rehabilitation was readily accomplished by means of amplified sound to the right ear, the cochlea of which seems to have been protected by the conductive lesion of long duration. The excellent discrimination score when the hearing aid was used proves that a so-called "disuse atrophy" has not occurred.

telephone amplification, and alerting the family and close associates to the problem at hand.

The psychological attitude of an older person facing a hearing problem is one of the greatest importance. Most such persons coming for examination have been pretty thoroughly indoctrinated by their friends with tales of failure to get help from such visits. If the otologist cannot reverse this process and build up an outlook of optimism, or at least a willingness to cooperate to the fullest, it may be wise to call in a psychiatrist. If the patient cannot be convinced of the possibility of improved communication, his prognosis is poor.

It is wise in all cases to request the patient to return at intervals of four months to a year, so that he may talk over his progress and his problems. Many older people require frequent


NAME W. H. AGE 60 Yrs. DATE 10-5-56 No.
THRESHOLD OF HEARING
(DECIBELS OF INTENSITY ABOVE NORMAL FOR CHILDREN)
P G S R
STANDARD
APPROX. TACTILE THRESHOLD
FREQUENCY 32 64 128 256 512 1024 2048 4096 8192 16384

SPEECH AUDIOMETRY		DISCRIMINATION TESTS — % SCORE	
FIRST AWARENESS	26 DB	AT NORMAL RATE IN QUIET	96
"HEARING THRESHOLD"	52 DB	AT NORMAL RATE IN NOISE	28

DIFFERENCE-LIMEN TESTS: NO EVIDENCE OF "LOUDNESS SENSITIVITY" IN EITHER EAR AT PLUS 10 DB OR PLUS 40 DB FOR 500, 2000, and 4000 C.P.S.

PITCH RECOGNITION: MATCHED BY EACH EAR AT 500, 1000, 2000, and 4000 C.P.S.

FIG. 2—The hearing tests of a 60-year-old man suffering from a "perceptive" hearing loss. His difficulty is principally one of discrimination, especially in any complicated listening situation. He showed definite signs of arteriosclerosis.

hearing tests to reassure them that they are not losing more hearing and facing greater problems as the result of it.

We should remember that the problems of geriatric otology are not just the problems of hearing. We are actually facing the problems of communication. The lesions may be divided into three general groups, conductive, receptive, and perceptive, with a single lesion rarely dominant. These problems are cumulative and progressive, and they are associated with many other changes in the individual as the result of passing years. We deal also with what might be called a "mass psychological problem," and it is only by following up in the minutest details, both medically and psychologically, that we will be able to help these patients. The measure of a hearing problem is not altogether the passage of years; it lies in the aging process, which varies with each individual, so it calls for individual evaluation. It might be appropriate to quote Senator Desmond of New York, Chairman of the Joint Legislative Committee on Problems of the Aging. He

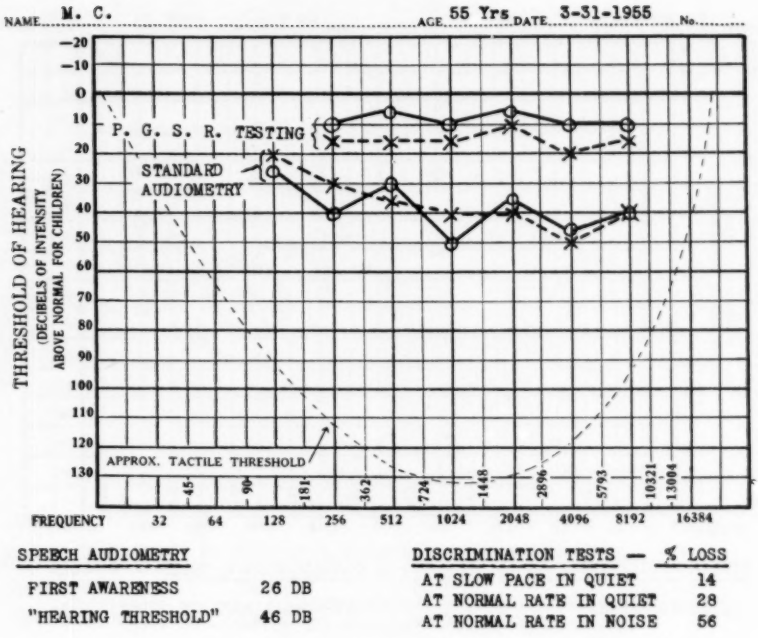

NAME M. C. AGE 55 Yrs DATE 3-31-1955 No.
P. G. S. R. TESTING
STANDARD AUDIOMETRY
THRESHOLD OF HEARING (DECIBELS OF INTENSITY ABOVE NORMAL FOR CHILDREN)
APPROX. TACTILE THRESHOLD
FREQUENCY 32 64 128 256 512 1024 2048 4096 8192 16384
SPEECH AUDIOMETRY
FIRST AWARENESS 26 DB
"HEARING THRESHOLD" 46 DB
DISCRIMINATION TESTS — % LOSS
AT SLOW PACE IN QUIET 14
AT NORMAL RATE IN QUIET 28
AT NORMAL RATE IN NOISE 56

FIG. 3—The hearing tests of a 55-year-old woman complaining of difficulty in hearing. She cannot wear a hearing aid successfully. Note the difference between the subjective and the objective (G.S.R.) audiograms. The difference between the two audiograms is similar to the difference registered in speech audiometry between the "first awareness of speech" and "speech understanding." She has the typical difficulty with discrimination of test words that is seen in "perceptive" deafness.

says, "You are not old unless you feel old. You feel that you have learned all you need to learn. You find yourself saying, 'I am too old to do that.' You feel tomorrow holds no promise. You would rather talk than listen. You have no plans for tomorrow. You would rather win an argument than be right." He might well have added, "All of your friends begin to mumble and drop their voices at the end of each sentence."

The problems of geriatric otology present to all of us a great and unsolved challenge.

DISCUSSION

GORDON D. HOOPLE, M.D., Syracuse, New York: Dr. Bordley has called our attention to an important phase of otology. Inasmuch as the losses in almost all of these elderly people are irreversible and we can do nothing to improve the organic condition, many doctors have thought that they have no medical responsibility in such instances. There has been a tendency to say, "I'm sorry, I can't help you," and let it go at that. This is wrong, for there is much we can do, and we should do it.

First of all, we, too, should take a positive attitude rather than a negative one. Surely we can be grateful that most elderly people do not have a handicapping hearing loss. In a world in which there are more people living to a ripe old age and in which there are going to be more, it is nice to think that most of them will retain enough hearing to live without any handicap.

A second positive step which we can take with each elderly patient who consults us about a hearing loss is to tell them that they will never lose all of their hearing. If you

have followed this practice, I do not need to tell you the importance of it. If you have not been accustomed to tell these folks that they will not become deaf, you have a pleasant surprise in store. You have no idea how much the thought of this very thing permeates the thinking of every one of these people.

Then we can be positive in telling these people that something can be done to improve their communicative ability even though we cannot improve the loss which is present.

Dr. Bordley has outlined some of the things that we can do, and I am not going to reiterate them. I would strongly support his advice that at least one other member of the family be present to learn, with the patient, what can be done. The public, and in this instance the family, should be educated in meeting the needs of the hearing handicapped even more than is the patient himself.

This is a problem we will face increasingly, so we should take steps to be as well informed as we can be. I am glad Dr. Bordley has brought it to our attention.

ABRAHAM I. GOLDNER, M.D., Flushing, New York: I would like to comment on Dr. Glorig's paper, which is extremely comprehensive and well done, and on Dr. Bordley's presentation on geriatric otology. Many of the problems that we encounter in everyday practice are crystallized in these papers.

One of the implications of the Wisconsin State Fair findings probably ties in with Dr. Bordley's presentation and concerns the influence of conductive or other types of impairment upon a pre-existent cochlear loss. I have noticed this phenomenon often in my experience with several thousand cases of occupational hearing impairment. This situation was graphically demonstrated by Dr. Bordley's first slide, and with his permission I would like that slide to be projected so that I can make an observation and pose a question to Dr. Bordley.

(Slide) The observation that I would like to make is that the level of hearing in the left ear, as far as the patient was concerned, was quite adequate; and if he had had hearing in his right ear to an equal extent, he probably would not have sought medical advice. But it was the superimposition of this new lesion, possibly due to degenerative disease, that brought him to Dr. Bordley for help.

It appears to me that, whereas a patient with an average loss of the cochlear type as great as 30 decibels may not appear to be handicapped and we may feel that he has no disability, such people are doubly handicapped by the superimposition of another disease. The disability in higher decibel losses increases not arithmetically but geometrically.

The same slide poses another problem having to do with the actual measuring of hearing disability. Applying the Fletcher method to the right ear for the free speech frequencies only, you would get approximate conversational loss of 55 per cent, but actually the man has no useful hearing. He describes himself as being stone-deaf. This would seem to indicate that under certain conditions the methods of expressing hearing disability are not accurate.

I am thankful for the privilege of presenting some of my own experience and of posing some of the problems and conflicts with which I have had to grapple, and I am grateful to both Dr. Bordley and Dr. Glorig for their presentations. I feel that it is a worthwhile task to carry on.

ARTHUR L. JUERS, M.D., Louisville, Kentucky: This has been a most interesting and contributive discussion, particularly the point that Dr. Bordley made on counseling these older people, and the comments by Dr. Hoople, which I think are most instructive.

One thought occurred to me here. You will note that, in Dr. Bordley's slide, the left ear has quite an abrupt drop in cochlear function, whereas the right ear, according to the story as I recall it, has been impaired since early in life. Could it be that the right ear has been subjected to much less wear and tear because of the conduction lesion and thus has been spared the deterioration in its cochlear function?

This is a somewhat speculative question, but I would like for Dr. Bordley to comment on that possibility.

DR. BORDLEY: I am very much indebted to the discussers of this paper. I want to thank them for being so lenient and yet bringing out the points that I particularly feel should have been brought out.

Dr. Hoople, you made one statement that the slide that we have been discussing disproves in a way. This patient was disabled, and he had given up hope. He had, as Dr. Juers said, a mighty good right ear. In the right ear, the bone conduction was far better than in the other ear and he had no discrimination problem.

I might say that Dr. Juers stole my punchline, because the last thing I had planned to

say was that we have four such patients, old people, with a good nerve in an ear that has had a long-standing conductive deafness, with very serious nerve impairment on the other side that has been exposed to the wear and tear of life. One wonders whether degeneration does always take place in the presence of conductive lesions.

I think another thing we might emphasize, Dr. Hoople, is that there are things that we can do, I believe, to prevent such a rapid degenerative course as some people have. With some of these people with high blood pressure and who are under a lot of pressure and strain, we have gotten very nice results in the long run. I feel that medical therapy is extremely important in this group of patients.

Dr. Goldner, your remarks about the importance of the loss in high tones of cochlear nature are certainly correct. The patient under discussion was perfectly happy until his high tones dropped. He was not badly handicapped because he still had an 80 per cent discrimination, but it was bothersome to him, very bothersome to him, and a loss like that does cripple a man a great deal.

I think that we are just on the verge of geriatric otology, and we have an awful long way to go. It has been very stimulating to hear these discussions.

THE ROLE OF STRESS IN OCULAR DISEASES

I. S. Tassman, M.D.
PHILADELPHIA, PENNSYLVANIA

The various systems of the body normally exist in a state of physiologic equilibrium. The relative normal balance maintained by organic structures and their surrounding environmental media when the cellular constituents are in constant interaction has been described by the term homeostasis.[5,39] The blood sugar level, for example, tends to remain constant under varying conditions because of specific homeostatic mechanisms. I believe that the mechanism which maintains a normal intraocular pressure can also be considered as an example of homeostasis in the ocular tissues, as will be discussed later.

Many eye diseases are related either directly or indirectly to the emotions and stress of life. Since most of the characteristics of ocular stress are of a nonspecific nature, they are apt to be considered of minor importance and receive much less attention than the specific factors concerned with the recognition and treatment of these conditions.

Selye's work opened the door to an era of better understanding of the mechanisms concerned in the adjustment of the body to the various forms of stress.[30,31] Previously, various nonspecific forms of therapy were employed in the absence of any definite knowledge concerning their mechanism. The most important progress was probably made in clarification of the role of the anterior pituitary and adrenal cortex in resistance to stress and the origin of disease.[6,32,33,34,35,36,37,38]

THE GENERAL ADAPTATION SYNDROME

The main purpose of the adaptation syndrome is to build up resistance to nonspecific stress. It differs in this respect from specific defense mechanisms which might set up a greater degree of resistance to a specific type of injury only. Exposure to stress results in three distinct stages of physiologic response.

1. *The Alarm Reaction*

The alarm reaction consists of an initial "shock phase" usually followed by a "countershock phase." The latter is manifested by defense against the initial shock in the form of enlargement of the adrenal cortex, with increased secretion of steroids. In addition, there are involution of the thymus and other lymphatic organs, certain metabolic changes, gastrointestinal ulcers, and variations in resistance to the organism. Blood changes include leukopenia and eosinopenia in addition to other signs of damage or shock.

2. *The Stage of Resistance*

When the manifestations of countershock are continued, the resistance of the body to a particular stimulus becomes increased. The total effect of all of the nonspecific reactions of the system eventually results in complete adaptation.

3. *The Stage of Exhaustion*

Exhaustion occurs when the adapta-

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Presented at the Sixty-First Annual Session of the American Academy of Ophthalmology and Otolaryngology, Oct. 14-19, 1956, Chicago.

tion acquired during the stage of resistance can no longer be maintained and is lost.

It was suggested by Selye that derailments of the adaptive mechanism are the principal factors in the production of certain disorders considered to be diseases of adaptation. The stage of exhaustion results from prolonged stress and expenditure of energy, which have weakened the body to a point at which definite physiochemical changes occur in the blood and in the function of various organs.

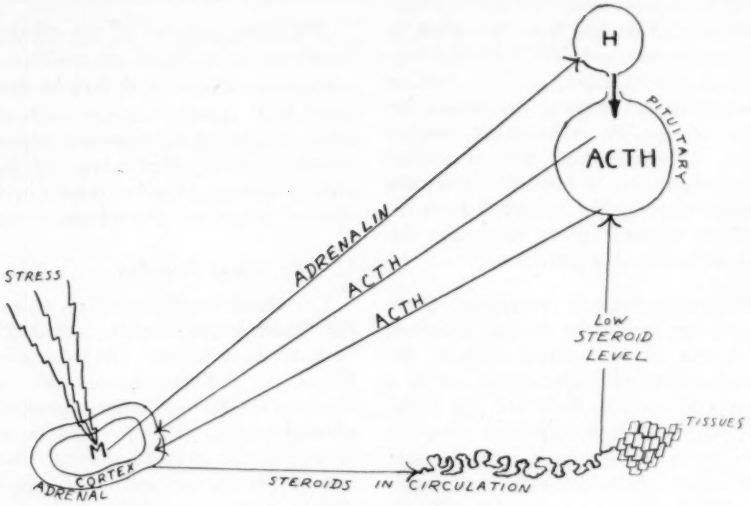

FIG. 1—Pituitary-adrenal action.

The Pituitary-Adrenal Action

The response of the adrenal gland in the countershock stage of adaptation is dependent on the function of the pituitary gland in secreting ACTH. The latter stimulates the adrenal cortex to secrete the steroids, with marked metabolic effects. The impact of shock or acute stress is conveyed to the hypothalamus and to the adrenal medulla by way of the autonomic nervous system. The medulla rapidly releases adrenalin, which stimulates the hypothalamus. The latter then releases a humoral substance, which, in turn, specifically stimulates the anterior pituitary to secrete ACTH (fig. 1). Regardless of the action of adrenalin, however, the hypothalamus and anterior pituitary may be activated in other ways to secrete ACTH. The latter then causes the adrenal cortex to release the steroids into the blood. These include, principally, cortisone, hydrocortisone, desoxycorticosterone, and the more recently identified aldosterone. The high concentration of steroids released is maintained by the continuous action of the pituitary acting under stress.[6,38,24]

The variations in the systemic blood level of the steroids also serve under certain conditions to regulate the secretion of ACTH. A cycle is set up to maintain a balance between secretion of

ACTH and the elaboration of adrenal steroids to meet the requirements of the body. Increased levels of hydrocortisone in the blood, as well as its increased excretion in the urine of both patients and animals, have been demonstrated under conditions of stress.

The Somatotrophic-Aldosterone Action

Secretion of the somatotrophic hormone (STH) with ACTH is also of importance in relation to stress. It has been shown that STH acts with aldosterone, which is one of the mineralocorticoids secreted by the adrenal cortex. The glucocorticoids, such as hydrocortisone, are antiphlogistic, since they inhibit inflammation, while the mineralocorticoids (aldosterone and desoxycorticosterone) are prophlogistic. STH in some way apparently augments the action of prophlogistic corticoids. This is probably due to direct sensitization of peripheral tissues to prophlogistic corticoids.[38] The type of reaction of the organs or tissues under stress depends apparently on which type of corticoids predominate at the time (fig. 2). If antiphlogistic, the reaction will be normal; whereas if the prophlogistic corticoids predominate, the reaction will be abnormal. Conditioning is an important property of the adaptive hormones and can determine whether a stressor will result in a physiologic adaptation syndrome or in a "disease of adaptation."

Local Adaptation Syndrome

While systemic stress causes a characteristic response of the body in the form of a general adaptation syndrome (GAS) characterized by morphologic and functional changes, local stress produces a local adaptation syndrome (LAS) characterized principally by defensive inflammation. The GAS and the LAS are considered to be interrelated because they are both nonspecific reactions involving damage and defense; both have three phases and are sensitive to the so-called "adaptive hormones" (ACTH, STH, corticoids).

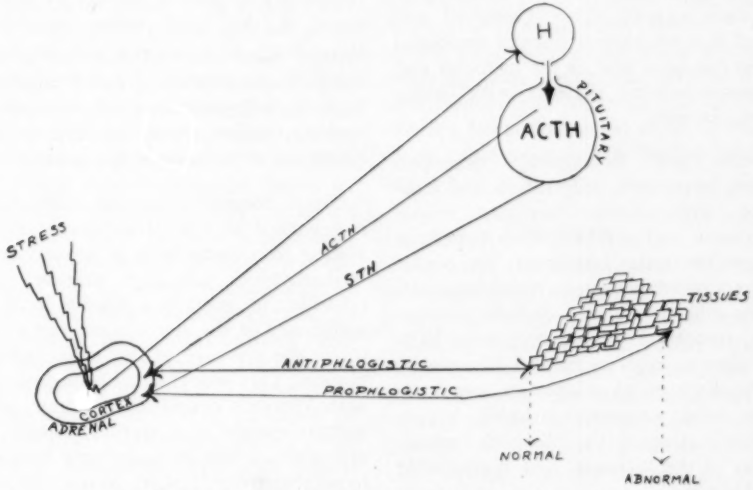

FIG. 2—Action of antiphlogistic and prophlogistic steroids after stress.

OCULAR STRESS

A number of ocular symptoms and diseases have no known specific causation. Some of these symptoms are nonspecific in character and the diseases may be classified as "diseases of adaptation." Campbell[4] considered migraine, glaucoma, thyrotoxic and malignant exophthalmos, myasthenia gravis and miners' nystagmus as diseases due to ophthalmic stress. Rotary nystagmus in the miner resulting from macular dysfunction in inadequate illumination was explained as an outlet to stress and shock. Migraine was described as an example of an adaptation syndrome associated with electrolyte imbalance. In the congestive type of glaucoma, vascular instability is the main sign of stress. Campbell also stated that evidence of mental emotional stress can be found in the histories and temperaments of patients with ocular stress diseases.

Grom and Rodriguez[12] described edema, hyperemia, infiltration and exudates, hypertension, vascular retinal symptoms, and pupillary disturbances as nonspecific ocular symptoms. The ocular diseases of adaptation included, especially, the collagen diseases, diabetic retinopathy associated with Kimmelstiel-Wilson disease, and retrolental fibroplasia. Local diseases of adaptation resulting from local stressors included hypertrophic conjunctivitis, fibrinous organization of the vitreous, and sympathetic ophthalmia.

Among the more important ocular diseases which will be considered here as diseases of stress and adaptation are (1) nongranulomatous forms of iridocyclitis, (2) retrolental fibroplasia, (3) angiospastic central serous retinopathy, (4) glaucoma, (5) hypertensive retinopathy, and (6) diabetic retinopathy. The collagen diseases, including polyarthritis and various other forms of arthritis with ocular manifestations, are generally considered today as diseases of adaptation, and they usually respond to steroid therapy. Therefore, I believe it would be proper to designate this form of treatment in such cases as "stress therapy."

Nongranulomatous Iridocyclitis

Nongranulomatous forms of iridocyclitis have in the past been treated by the use of nonspecific fever therapy in addition to the usual local treatment. The administration of typhoid vaccine, which produced a good, febrile reaction, relieved the iritis and the iridocyclitis because of the endogenous cortisone secreted as the result of the stress. In most cases of this kind today, exogenous steroids or corticotropin are employed for the same purpose. It has been shown that the administration of intravenous typhoid vaccine results in an increased excretion of steroids in the urine.[6,27]

Since nongranulomatous iridocyclitis is regarded as a local inflammation resulting from some form of sensitivity or irritant which acts as a stressor, it is possible that initially a relative local insufficiency of the steroids may be a factor in the presence of the ocular inflammation. This would not be inconsistent with Woods's definition of nongranulomatous uveitis as a sterile, allergic reaction dependent on underlying bacterial hypersensitivity.[48] Of course Woods treated his cases of nongranulomatous uveitis with the intravenous administration of streptococcus vaccine in order to desensitize the patient, and he obtained successful results in 80 per cent of such cases which were adequately treated. In discussing the importance of nonspecific inhibition of inflammation, Steffenson[40] stated that both corticotropin and cortisone prevent the signs and symptoms of allergic states by blocking the antigen-antibody reaction.

Although the mechanisms by which the local inflammation is inhibited are still under investigation, it seems that certain ocular inflammations are a manifestation of tissue alterations resulting from prolonged stress and a relative local insufficiency of the adrenal steroids. The administration of steroids could then act as replacement therapy to restore the homeostatic mechanism.

O'Rourke and his co-workers[25] found that acute anterior ocular conditions responded readily to steroid therapy, although they were not convinced that prednisone was any more effective in their series of cases than other steroids. Many cases of post-traumatic and postoperative iridocyclitis are undoubtedly associated with stress. King and his colleagues[22] employed prednisone and prednisolone with benefit when other forms of therapy failed in these cases. Hogan and his co-workers[20] found that this form of iridocyclitis responded rapidly to the local application of steroids. They also found that rheumatoid forms of iridocyclitis respond rapidly, although two of their cases required subconjunctival injections before the effect was obtained. They suggested that injection of the steroids under Tenon's capsule, as advocated by Swan, might be more effective than simple injection beneath the superficial conjunctiva.[21] I have used subconjunctival injections in cases of postoperative iridocyclitis and of other forms of iridocyclitis with good results when topical instillations proved to be less effective. It is possible that there is a local deficiency of steroids present in the ocular tissues which in some way is more readily overcome by the subconjunctival injection.

Sympathetic Ophthalmia

Sympathetic ophthalmia has also been described as a local adaptation due to a local agent of stress.[12] Hogan et al.[20] treated three such cases with cortisone systemically and reported excellent results in two of these. Gordon,[11] who described the metabolic effects of prednisone and prednisolone as similar to their "parent compounds" cortisone and hydrocortisone, also reported a case of sympathetic ophthalmia treated systemically with prednisone. With this form of therapy, he obtained an improvement in vision from 20/200 to 20/15 within ten days. Gordon also stated, "Inevitably, some patients will fail to respond to one steroid and will be benefitted by another." This might be explained by the fact that the necessary type of corticoids is lacking, while others predominate in the tissues as the result of the conditions of stress at a particular time. According to a report by Winter,[47] favorable results were obtained in patients suffering with sympathetic uveitis who were treated with cortisone and ACTH. When a later relapse did occur in these cases, it was controlled by further steroid therapy.

Retrolental Fibroplasia

Although the incidence of new cases of retrolental fibroplasia has been greatly diminished, this disease can be definitely classified as an ocular disease caused by stress. Both the condition of prematurity of the infant and the increased oxygen environment in the early days of the infant's life can be considered as the stressing agents. In these cases, the ocular structures primarily affected by the stressors are the retinal vessels. The prematurity of the infant and its poor development at birth were too great to permit adaptation to the excessive amount of oxygen to which the infant was exposed. Secondly, the hyperoxia in these infants initiated the earliest changes in the young vessels of the retina followed by the subsequent changes characteristic of the condition. The disease probably represents a fail-

ure of adaptation to the unusual stress which the premature infant and the ocular tissues have had to endure.

The Autonomic Nervous System and Ocular Stress

Most of the ocular diseases due to stress present evidences of chronic mental and emotional strain associated with dysfunction of the autonomic nervous system. In the majority of instances, the sympathetic system is the one more frequently affected. The chief defense mechanism against stress is the increased activity of the pituitary-adrenal system. This may also be accompanied by additional evidences of emotional stress.

Koch[23] stated that since the distribution of the vasoconstrictor fibers of the sympathetic system includes ramifications to all cerebral and retinal arterioles, certain entities which come to the attention of the ophthalmologist are outstanding expressions of autonomic instability. This was also pointed out earlier by Harrington,[13] who stated that the hypothalamus was shown, among other things, to carry out the autonomic expression of emotion and that the vasoconstrictor action of the sympathetic system is most important as a function of the autonomic nervous system. Evidences of emotional stress and alterations in the function of the autonomic nervous system are commonly observed in such ocular conditions as angiospastic central serous retinopathy, glaucoma, and hypertensive and diabetic retinopathy.

The importance of emotional disturbances and the function of the autonomic nervous system in regard to ocular diseases have been emphasized in the past by Schoenberg,[29] Harrington,[13] and Hartmann.[16] Among the ocular syndromes of psychogenic origin, Harrington[14] described (1) such ocular manifestations of vasomotor disturbance as (a) amaurosis fugax, (b) migraine, (c) neurocirculatory asthenia, (d) central angiospastic retinopathy, (e) Raynaud's disease; (2) glaucoma; (3) ocular manifestations of hysteria. With regard to glaucoma, Harrington[15] pointed to the evidence indicating the close relationship between the intraocular vascular circulation, the secretion of the intraocular fluid, the level of intraocular pressure, and their control by the autonomic nervous system. He stated, "There are many aspects of glaucoma which cannot be explained by the purely mechanical theories of aqueous drainage." In this he not only agreed with Schoenberg's contention that a glaucomatous crisis could be precipitated by anxiety in some patients with previously glaucomatous eyes, but also that chronic emotional disturbances may play an important role in the progress of primary glaucoma regardless of congestive failure or crisis. Hartmann[18] also stated that emotional factors can either cause, start or increase ocular symptoms and that such emotional disturbances are mediated through the autonomic nervous system.

Central Angiospastic Retinopathy

This condition usually occurs in one eye of young men who present definite evidences of emotional instability, usually characterized by constant suppressed anxiety.[13] They may also show clinical evidences of peripheral vasoconstriction associated with the angiospastic ocular lesion. In the early stages, a serous edema in or around the macular area is the important ocular lesion. In most cases the condition will improve with rest and removal of the patient from any disturbing environment or condition to which he might have been exposed. Since the condition is caused by an angiospasm of the capillaries surrounding the macula, relief may be obtained also by the use of vasodilator drugs like Mecholyl® and Prostigmin,® which act

especially through the parasympathetic system, or by the use of sympathetic blocking agents such as Priscoline.[16] This is also evidence of involvement of the autonomic nervous system resulting from emotional stress.

Primary Glaucoma

Since the real cause of glaucoma is still unknown, this disease presents a problem which involves more than a study of the angle of the anterior chamber and the intraocular tension alone. A narrow angle and increased tension are probably the ocular manifestations or the end results of a number of alterations in function of several systems. The emotional state of the individual, his family history, his own reaction to the stress and strain of life, the stability of the autonomic nervous system, and the general vascular condition are several related factors which can have an important bearing on the onset of the disease. When patients with glaucoma are studied, it can be observed that they commonly exhibit such emotional states as constant anxiety and worry, suppressed irritation, often a feeling of frustration and inadequacy, and sometimes a state of excitement and shock. Hartmann[17] outlined the treatment of the emotional state of the patient, which he described as an important factor in the origin and course of most cases of glaucoma.

Cases of acute glaucoma have been known to be precipitated by a sudden shock, by the ordeal of an operation, or by other severe illness in the patient or in some member of his immediate family. In my own experience, a hospitalized patient suffered an acute attack of glaucoma in one eye several days after a gallbladder operation. In another case, an acute attack of glaucoma occurred in the second eye of a patient who was convalescing from an operation for glaucoma in the first eye. Weinstein and Foldes[46] referred to this as "so-called glaucoma sympathicum" and stated that there is a predisposition to glaucoma in the second eye. The operation represents a shock to the nervous system, which, through a reflex mechanism, produces a sudden rise in tension. Egan[7] described four cases which he designated as "shock glaucoma" because they were induced by physical shock in the form of a fall. In precipitating the glaucoma in these cases, the physical trauma no doubt acted in the same manner as would emotional stress or other forms of stress.[28]

The diencephalon has for some time been suspected as the center for the control of intraocular pressure. Von Sallmann and Lowenstein[45] stimulated the diencephalon of cats electrically and obtained simultaneous responses in intraocular pressure, blood pressure, the activity of the vessels in the ear auricles, the pupils, and the nictitating membranes. Reactions to the stimulation of a ventral area of the hypothalamus indicated a diffuse discharge via the sympathetic system. Intraocular pressure effects were frequently found to coincide with changes of systemic blood pressure. In earlier experiments on cats, von Sallmann and colleagues[44] obtained similar parallel changes in intraocular pressure and blood pressure after intravenous injection of adrenergic mediators.

Stepanik[41] found that elevation of the tension curve in glaucomatous eyes coincided with a decrease in the eosinophil count. He stated that the number of blood eosinophils is controlled by interaction of the hypothalamus, pituitary and adrenal cortex, and he believes that there is support for the probability of regulation of intraocular tension through the hypothalamus.

Elwyn[8] described primary glaucoma as a "strictly functional disease in the early stages due to an irregular and in-

sufficient production of acetylcholine." According to this author, the condition ceases to be functional when organic changes have been produced in the angle of the anterior chamber by the increased pressure. His statement, however, that "there is no known balance between the sympathetic and parasympathetic systems in the control of intraocular pressure" must be open to question. Weinstein and Foldes[46] in their book on Glaucoma elaborate on the important part played by the vegetative nervous system in the development of normal physiologic ocular tension and refer to a number of authors to support the statement that "in the pathoetiology of glaucoma, the equilibrium disturbances of the sympathetic-parasympathetic nervous system play a very important role." Weinstein also referred to the experiments of Szaz, which demonstrated that an acute attack of glaucoma is connected with paralysis of the parasympathetic system, while glaucoma simplex is associated with excessive activity of the sympathetic system.

In describing the mechanism of primary glaucoma, Sugar[42] stated that this "cannot be thought of on the basis of conflicting mechanical and neurovascular schools of thought." Both mechanisms are really involved in various ways, depending on the type of glaucoma being considered. The mechanical form is activated by neurovascular stimuli, while neurovascular mechanisms often require some mechanical changes to be effective.

Vail[43] believes that acute inflammatory (narrow angle) glaucoma is present in those individuals with a strong neurovascular or psychogenic background. In such patients a neurovascular crisis could precipitate an acute attack.

Hypertensive Retinopathy

Retinopathy usually results after a persistently elevated pressure and prolonged constriction of the arterioles. The duration of the condition is therefore an important factor in the occurrence. The blood flow through the terminal blood vessels is regulated by their muscular segments. The products of local tissue metabolism and nerve impulses control the muscular segments of the capillaries. The nerve impulses which produce constriction are probably activated by epinephrine or epinephrine-like substances. Dilatation, on the other hand, is produced by the action of acetylcholine. The peripheral circulation can also be affected by vasodepressor substances and the adrenocortical hormones.

Rodbard and Katz[26] stated that vasodilatation and vasoconstriction are intricately balanced for the distribution of blood according to the need.

Secretion of excess epinephrine causes vasoconstriction and increases the metabolic rate, blood sugar, irritability and anxiety. Excessive norepinephrine induces generalized vasoconstriction and results in paroxysmal or persistent hypertension. It was also demonstrated experimentally by von Sallmann and his co-workers[44] that ACTH potentiates the action of adrenalin, noradrenalin and acetylcholine on the peripheral vascular apparatus.

Since retinopathy is more common in cases of hypertension of long duration or in the malignant type of hypertension, it is logical to fit the chain of events observed in these cases with the general adaptation syndrome. Their sequence may not be altogether clear at present, but the activation of the neurovascular mechanism by adrenalin, noradrenalin or other similar mediators could at the same time affect the retinal arterioles and lead to the eventual changes which characterize the retinopathy. Moreover, under certain unfavorable metabolic conditions, excessive secretion of ACTH by the anterior pituitary, under stimulation

of the hypothalamus, could result in an endogenous excess of the individual's own corticoids, which might influence the damaging effects on the vascular system. It is also possible that an increased secretion of renin by the kidneys would augment the pressor effects on the peripheral vessels in patients with prolonged or chronic emotional disturbances.

The beneficial effects reported with the use of hypotensive drugs which act as autonomic blocking agents in the treatment of hypertension with retinopathy[3] are also evidence that dysfunction of the autonomic nervous system associated with stress was responsible for the pathologic condition.

Diabetic Retinopathy

Most of the patients suffering with diabetes belong in the same category with those with glaucoma and hypertension. The chronic emotional stress in these patients is also related to existing disturbance of function in the autonomic nervous system and, more especially, in the endocrine system. Mental and emotional stress was found to be an important factor in the onset and course of this disease by Hinkle and Wolf,[19] who studied more than fifty cases from this standpoint. There is also considerable evidence which indicates an increased activity of the adrenal cortex in patients with diabetic retinopathy. This again introduces the relationship of continued stress to the secretion and blood levels of the steroids, with its possible effects in these patients.

Diabetes mellitus can be considered to be a "disease of adaptation." The incidence of diabetic retinopathy has been increasing with the increase of life stress. The adrenal cortex is responsive to the administration of exogenous ACTH as well as to endogenous ACTH. Increased secretion of ACTH during pregnancy has caused retinopathy which cleared up after termination of the pregnancy. Retinopathy was produced by Becker,[1] who administered ACTH to rabbits which had been made diabetic with alloxan. Becker also found that the prolonged administration of ACTH was associated with increased lipoid secretion in the zona fasciculata of the adrenals. In addition to the pancreatic lesions in the diabetic person, an excessive amount of ACTH is an important factor in the development of the retinopathy. The increased secretion of glucocorticoids with hyperglycemia in these cases follows the adaptation pattern.

In a current study by Gibbs,[9] which is still in a preliminary stage, the results suggest that in cases of diabetes which tend to cause retinitis there is also an increased reactivity of the adrenal cortex. This reactivity is shown by an excessive outpouring of adrenal stress hormone in response to a dose of ACTH. The results thus far also confirm the finding that increased adrenal activity occurs in poorly controlled diabetes.

Bookman and his colleagues[2] studied five cases of diabetes which developed in patients receiving steroid treatment. They described a type of steroid diabetes which could develop in patients who were being treated with ACTH or cortisone. None of their patients had had glycosuria or hyperglycemia before therapy was started. Evidences of the diabetes disappeared when the ACTH was reduced or discontinued. The retinopathy in diabetics was also considered by Goodman[10] to result from a metabolic disorder characterized by a hormonal imbalance.

SUMMARY AND CONCLUSIONS

Mental and emotional stress is an important nonspecific factor in the origin of a number of ocular diseases. It is intimately concerned with disturbance of

homeostasis in the ocular tissues, particularly in patients with glaucoma. It is also closely associated with dysfunction of the autonomic nervous system and the pituitary-adrenal system in the occurrence of primary glaucoma, hypertensive retinopathy and diabetic retinopathy, in particular.

The general adaptation syndrome is applicable to certain physiologic functions in the structures of the eye. Some ocular symptoms and diseases fit the pattern of diseases of adaptation. Most of the cases of nongranulomatous iridocyclitis, retrolental fibroplasia and sympathetic ophthalmia can be regarded as examples of ocular diseases of local stress. In cases of central serous retinopathy and of collagen diseases involving the eyes and in many cases of acute and chronic glaucoma, as well as hypertensive and diabetic retinopathy, stress plays an important role in the causation and in subsequent changes which occur.

The secretion of ACTH and the adrenal hormones in response to chronic stress apparently has a close relationship to the incidence of retinopathy in patients with vascular hypertension and diabetes mellitus, especially in cases of long duration. These diseases are characterized chiefly by evidences of mental and emotional stress, and by disturbances of the pituitary-adrenal secretions with metabolic and biochemical derangements. Although considerable scientific evidence is presented in support of this, specific, positive proof of cause and effect in the various ocular disorders is admittedly still lacking.

The complex interaction between the various mechanisms involved will require further study in order to clarify the exact sequence of events as they occur in the development of the particular disease.

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DISCUSSION

HARLEY E. CLUXTON, JR., M.D., Chicago: Every physician today is being confronted with patients who are either being treated or have been treated with ACTH or cortisone.

HYPOTHALAMIC-PITUITARY-ADRENOCORTICAL SYSTEM

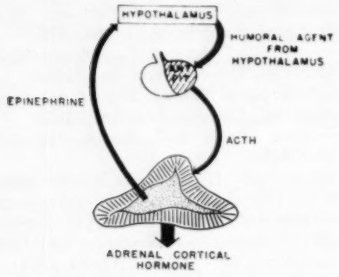

FIGURE D-1.

Certain metabolic changes occur, and an understanding of the basic physiologic relationship and function of the pituitary and adrenal cortex is paramount.

Normally the adrenal cortical steroids are produced by endogenous ACTH from the anterior pituitary. In the absence of the pituitary, adrenal cortical atrophy occurs. Regulation of production of the endogenous ACTH is primarily governed by the level of circulating hydrocortisone. Under stress, epinephrine and other chemical substances in the body are secreted; they act on the hypothalamus to produce a humoral agent that stimulates ACTH. Figure D-1 illustrates the pathway of this neuropsychic stimulation.

EFFECT OF ACTH ON PITUITARY-ADRENAL SYSTEM

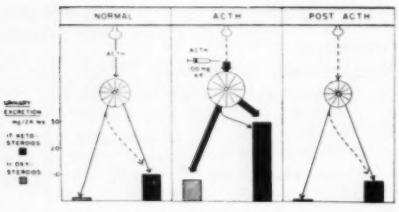

FIGURE D-2.

When ACTH is administered, hyperplasia of the adrenal cortex occurs, with an extensive production of cortical hormones, particularly hydrocortisone, and a decreased production of endogenous ACTH (fig. D-2). If administration of exogenous ACTH is stopped suddenly, a lag phase of five to seven days' duration occurs before the pituitary adrenal system recovers. It is during this time that the patient is in a relative state of adrenal cortical insufficiency and may develop an adrenal crisis if he should be subjected to such stress as a severe infection, an operation, or an injury. The lag phase after

EFFECT OF CORTISONE ON PITUITARY-ADRENAL SYSTEM

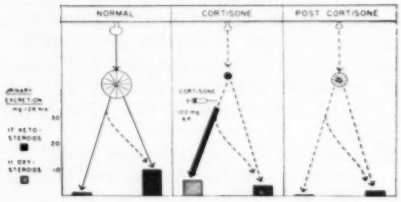

FIGURE D-3

ACTH therapy is much shorter than the lag phase after therapy with cortisone and similar preparations. The reason for this difference is that cortisone depresses both the pituitary and the adrenal cortex (fig. D-3). If cortisone is given for several weeks, the lag phase may last as long as six weeks to a year after therapy is stopped. If therapy is stopped suddenly, the resulting adrenal cor-

FIGURE D-4.

tical insufficiency can be as severe as operative removal of the patient's adrenal glands. Deaths of patients have resulted with the cessation of therapy, for there is a tendency to stop ACTH or cortisone when surgery, in-

FIGURE D-5.

FIGURE D-6.

fection, or trauma occurs. The early signs and symptoms of adrenal cortical insufficiency must be kept in mind.

Adrenal cortical function comprises the following: (1) mineral metabolism, particularly sodium and potassium balance; (2) carbohydrate, fat, and protein metabolism; (3) regulation of the eosinophils, and of lymphoid and thymus tissue; (4) androgenic function; and (5) pigment metabolism.

The signs and symptoms of adrenal cortical insufficiency can best be illustrated by Addison's disease, in which one finds (1) weakness and easy fatigability; (2) anorexia and often constipation; (3) hypoglycemic manifestations; (4) dizziness and syncopal attacks, (5) increased pigmentation; (6) low backache and muscular cramps; (7) decrease in rate of hair growth; and (8) nervousness and mental symptoms. Pertinent laboratory findings reveal a decrease in serum sodium, an elevated serum potassium, hemoconcentration, low blood sugar, and a flat glucose tolerance curve, in addition to a decrease in urinary 17-ketosteroid and 11-oxysteroid production.

Mrs. P. H., age 55 years, had a typical case of Addison's disease (fig. D-4). In 1948 she had had a severe attack of scarlet fever. Shortly thereafter, she had gradually developed the above signs and symptoms; however, it was not until a crisis developed in 1949 that the clinical entity was recognized. Since then the disease has had an uneventful course and is well regulated on small amounts of hydrocortisone and long-acting desoxycorticosterone. Her skin has lightened up; the texture is much improved; there has been a gain in weight; her energy and pep have returned to normal.

ACTH and cortisone are most often used in amounts exceeding the normal physiologic range, and if they are given for prolonged periods of time, signs and symptoms of adrenal hyperfunction similar to that found in Cushing's syndrome may develop.

Miss H. L., a 32-year-old woman, had a gradual onset of moon face, with florid complexion and redistribution of weight, an increase of fat in the supraclavicular areas, buffalo hump, thinning of the arms and legs, protuberant abdomen, increased facial and body hair with thinning of the scalp hair, acne, easy bruising of the skin, amenorrhea, headaches, hypertension, mild diabetes, nervousness, weakness and backache. These symptoms and signs developed over a period of three years. Laboratory data revealed an increase in the hemoglobin and erythrocytes; there was a leukocytosis with an eosinopenia. Fasting blood sugar was slightly above normal, and the glucose tolerance curve indicated diabetes. There was an elevated serum sodium and a decreased serum potassium. Roentgenograms of the spine showed demineralization. Urinary 17-ketosteroids and 11-oxysteroids were increased. When she was operated upon, she was found to have hyperplasia of both adrenals; a bilateral adrenalectomy was done. Six months later the features of Cushing's syndrome had all disappeared (fig. D-6), and she began to menstruate. The case is well controlled by replacement therapy consisting of hydrocortisone and long-acting desoxycorticosterone.

Between the extremes of hypocortical and hypercortical function encountered in the use of ACTH and cortisone, there occurs a much larger group of cases in which these manifestations are of a much milder degree, although they can often be detected early in the course of the patient's treatment.

Several other points should be kept constantly in mind by the physician who administers ACTH and cortisone. Systemic manifestations, such as fever, tachycardia, leukocytosis and increased sedimentation rate, may be lowered in the presence of an infection. Pain is often diminished, and the patient with a tendency toward psychosis is frequently euphoric. It is therefore important to be always on the alert for the presence of inter-

current infection when the use of an antibiotic becomes mandatory. Modification of the inflammatory reaction is brought about by a decrease in vascular exudation, a decrease in pus formation in spite of leukocytosis, and a decrease in walling off by the lymphocytes and fibroblasts. Unless large doses of ACTH and cortisone are used to such an extent that Cushing's syndrome is produced, there is no retardation of wound healing, neither is there any real threat of reactivation of an old walled-off tuberculous lesion of the lung.

FIGURE D-7.

FIGURE D-8.

Abolishment of the allergic reaction is well known; however, the mode of action is as yet not definitely worked out. The local swelling, itching, redness, and vesicle formation can be inhibited.

The presence of a gastric or duodenal ulcer is no contraindication to the use of ACTH and cortisone when these hormones are necessary. In such situations, the ulcer should be treated vigorously while the patient is receiving steroid therapy. The possible precipitation of an ulcer in a patient on steroid therapy should keep the physician constantly on the alert for early symptoms which may be masked.

ACTH and adrenal cortical steroids do not cause diabetes, but they may bring to light a latent form of diabetes. ACTH and cortisone can be of early help in determining whether a patient with potential diabetes has the disease. When a patient has diabetes, ACTH and cortisone may be used safely if the usual methods of control of the diabetes are maintained.

It has been said that ACTH and cortisone do not "cure" any diseases. This is mostly true; however, steroid therapy affords the physician a means of controlling some diseases which otherwise may be fatal. One example of its use is in acute disseminated lupus erythematosis. Miss N. G., a 26-year-old woman, was moribund in January 1951 (fig. D-7). After just a few days of ACTH therapy, she began to improve steadily. Today the erythematosis remains in good control on alternate courses of ACTH and steroid therapy (fig. D-8).

In summary, ACTH and adrenal cortical steroid therapy, when judiciously used, are an important and frequently necessary form of adjunctive therapy. The action of the adrenal cortical steroids is at the cellular level with the result that the tissue cells continue to function in a nearly physiological manner regardless of the abnormal environment resulting from trauma, infection, allergy, or toxic chemicals.

DAVID O. HARRINGTON, M.D., San Francisco: I am grateful for the opportunity to discuss Dr. Tassman's excellent paper.

It seems to me that we have come a long way in the past ten years in our understanding of the complex mechanisms involved in stress and its effect on the human organism. I, for one, feel that we owe a debt to Dr. Tassman for his careful review of this difficult and sometimes neglected subject and for

bringing us up to date on the ocular syndromes which are the manifestions of response to stress.

In 1947, in discussing the subject of Psychosomatic Interrelationships in Ophthalmology before this Academy, I called attention to dysfunction of the autonomic nervous system which is of such obvious clinical importance in the etiology and pathogenesis of such ocular conditions as central angiospastic retinopathy, migraine, and glaucoma. The role of emotional stress in the pathogenesis of these diseases was emphasized.

At that time we were concerned mainly with the physiologic disturbances initiated by prolonged or recurring anxiety states through the autonomic nervous system, with particular reference to vasospasm and its attendant symptoms and signs. In our efforts to understand and explain the mechanisms by which emotional stress could cause severe and prolonged physiologic disturbance, which, in turn, eventually gave rise to cellular changes, we were dependent on our knowledge of the anatomic and physiologic evidence of cortical control of the vegetative nervous system through the hypothalamus. We knew, on the evidence of physiologic and anatomic experimentation, that this portion of the brain contains important integrating mechanisms for vegetative functions. These mechanisms produce their effects by influencing lower subordinate complexes. In turn, the hypothalamus is under a certain measure of control from the cerebral cortex. Thus, we had direct evidence for cortical or emotional control of the vegetative nervous system, but the exact manner in which such control could affect localized ocular vascular disturbances, intraocular pressure, and the like was far from clear.

Now, as Dr. Tassman has so clearly pointed out, our understanding of the mechanisms concerned in the adjustment of the body (and the eye) to various forms of stress has been vastly improved through the work of the biochemists and endocrinologists, especially that of Selye.

This increasing knowledge of the chemistry of the endocrine systems of the body shows us the manner in which both general and ocular stress set up a chain reaction leading to eventual balance or imbalance in hormone secretion and resulting in physiologic adaptation or disease. The complex mechanisms by which emotional stress is capable of producing autonomic and endocrine dysfunction, eventually leading to irreversible cellular change, have been clearly and logically demonstrated by Dr. Tassman both in general terms and with reference to specific ocular disease. There would seem to be little reason today for the skepticism which so largely prevailed ten years ago in discussions of the role of stress in ocular disease.

I was particularly interested in the author's remarks on primary glaucoma. I have had no reason to change the belief expressed in 1947, "that emotional disturbance may play a definite part in the progress of a primary glaucoma without reference to congestive failure or crisis." On the contrary I have become more and more convinced that the majority of patients with glaucoma, both of the wide angle and of the angle closure type, have a personality pattern which I have come to call "the glaucoma personality," which is, in essence, a type of chronic anxiety state or even an anxiety neurosis.

In most instances, very little probing is required to elicit the existence of this personality pattern, but one must be concerned with it as well as with the tonometric, tonographic, perimetric, gonioscopic and ophthalmoscopic findings which go to make up the composite picture which is glaucoma.

It is not my thesis, nor, I am sure, is it Dr. Tassman's, that glaucoma is purely a stress disease, but in the light of the evidence presented I would urge you to consider more seriously the role of psychic trauma as an important causal factor in many cases of glaucoma. This will in turn lead to a more rational and complete therapy of the disease.

DR. TASSMAN: I simply want to take this opportunity of thanking the discussers, Dr. Cluxton and Dr. Harrington, for the additions that they have made to this presentation.

The purpose is not to emphasize the fact that patients suffering with ocular disease are neurotic or unusually nervous. It is to call attention to several very important associated factors which we must consider more seriously in the future, as Dr. Harrington stated, in connection with all the other features of the disease.

THE TREATMENT OF RETINAL DETACHMENT BY VITREOUS IMPLANT

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NEW YORK, NEW YORK

THE problems involved in trying to reattach a stubborn retina brings headaches and heartaches to our patients, as well as to most of us who practice ophthalmology. Many methods for repair, none completely satisfactory, have been tried. In 1949, after over a year of experimental animal surgery and after various modifications, a new method was tried. It is called a vitreous implant. This paper presents our experience in performing 72 consecutive vitreous implants, all of which were for detached retinas previously treated by an accepted technique, which had failed. It is emphasized that every case had already been treated unsuccessfully from one to five times by diathermy or by the various scleral techniques before the vitreous implant was tried.

DEFINITIONS

Some definitions specific to our technique are in order.

Vitreous: This is the material aspirated from the vitreous chamber of an enucleated human eye by means of an 18-gauge needle and syringe. It is colorless, of oily viscous consistency, and sterile, and it stores in glass vials in a household refrigerator at 40° F. without apparent change. It does not react to blood typing procedures or to a Wassermann test. It has been deliberately contaminated with hemolytic streptococci and staphylococci, and in forty-eight hours at 40° F. it is again sterile on a blood agar culture. At the Eye Bank laboratories are many samples of vitreous which are six, seven and eight years old. It is not formed vitreous but is rather an aspirate of vitreous. It has been implanted in over a hundred eyes without reaction or loss of an eye.

Vitreous implant: This is the name given to the injection of human vitreous into an eye with retinal detachment. It is accompanied by diathermy and subretinal drainage. The technique will be described later and will be demonstrated by a motion picture. It is not to be confused with the vitreous transplant used in cases of hemorrhage. No vitreous is withdrawn in the vitreous implant; rather, more is added.

Successful reattachment of the retina: This is defined as reattachment of all the available retina for a period of six months or more. The qualification of "available retina" is made because the series includes two cases of retrolental fibroplasia, in which much of the peripheral retina was no longer functioning retina and was not available for reattachment.

PREMISES FOR USE OF THE VITREOUS IMPLANT

Three premises may be postulated for the use of the vitreous implant: (1) surgical, (2) physiological, and (3) anatomic.

1. *The Surgical Premise*

From the standpoint of surgery, the use of vitreous has the hydraulic advantage of "pushing" the retina against the

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choroid by building up the pressure within the vitreous chamber. In doing this, the subretinal fluid is more completely forced out through the drainage holes provided. This action is temporary and of advantage only during the actual operation; probably it is as well accomplished by air or saline solution, as used by various surgeons.[3,4]

A greater surgical advantage in the use of vitreous is that it appears to be retained by the eye and not lost in a few days, as is air and presumably saline solution.

2. *The Physiologic Premise*

The physiologic premise for the use of vitreous has several facets. One is that it is more viscous than air or saline. If most retinal detachments are preceded by a forward detachment of the vitreous body,[5] then the posterior portion of the vitreous chamber is occupied by a less viscous fluid.[2] This would permit the vitreous framework to swing and pull on its attachments at the ora and retina, causing new tears and detachment.[6,7] The implanting of a viscous material in the vitreous chamber should reduce the amount of movement of the vitreous framework and thus the likelihood of redetachment.

Finally, the implanted vitreous was created in a vitreous chamber of the donor eye and is a well-received occupant of the vitreous chamber of the recipient eye. Vitreous, rather than air or saline solution, seems the logical occupant of the vitreous chamber.

3. *The Anatomic Premise*

The anatomic premise for the use of vitreous is that vitreous is a normal support of the retina. Between its anterior attachments at the ora and the posterior attachment at the nerve head there is no support for the retina but the nebulous prolongations of the pigment cells. It is believed that the intraocular pressure through the volume of the vitreous keeps the retina against the choroid.[1] When the vitreous volume is reduced, as after vitreous loss during cataract extraction, the stage is set for retinal detachment. Similarly, when much vitreous is lost as subretinal fluid drained away during retinal surgery, the stage is set for redetachment. The implantation of vitreous should, therefore, restore the volume of the vitreous body after retinal detachment and thus help in reattaching the retina and in keeping it attached.

TECHNIQUE

After reflecting the conjunctiva and such muscles as are necessary to accomplish the planned diathermy, the vitreous sclerotomy site is prepared. A 4 mm. incision is made at right angles to the limbus and with the center of the incision 8 mm. posterior to the limbus. The cut should go down to the pars plana but not through it. A mattress suture of 5-0 Dermalon® is placed across the incision in an edge-to-edge manner. The arms of this mattress suture should be 1.5 mm. apart. Then a second Dermalon® mattress suture, also edge-to-edge, is placed with the arms 4 mm. apart and opposed to the first suture. The sutures thus can be tied easily, each against the counterpull of the other, and will provide a watertight closure. The procedure is done most easily when the sclerotomy is placed inferotemporally or superotemporally, but there may be some advantage in having it approximately 180 degrees from the largest retinal tear.

The operator then proceeds with diathermy around the tears. In the cases presented, about half the operations were done with a perforating diathermy and half with a nonperforating technique. At present, a nonperforating arcade around the tear is being used. It must make a waterproof dike of diathermy reaction

TABLE I

SUCCESSFUL RESULTS IN 72 CONSECUTIVE VITREOUS IMPLANTS IN 64 EYES IN RELATION TO PRESENCE OF PREOPERATIVE COMPLICATIONS*

COMPLICATING FACTOR†	VITREOUS IMPLANTS	NUMBER SUCCESSFUL	PER CENT SUCCESSFUL
Total Detachment	41	16	39
Fixed Retinal Folds	12	4	33
Massive Vitreous Retractions	2	0	0
Vitreous Bands	14	4	28
Myopia—4 Diopters or Less	23	15	65
Myopia—5 Diopters or More	12	3	25
Aphakia	33	11	33
Previous Scleral Resections	10	6	60
2 or More Previous Operations	50	20	40

*In each case at least one unsuccessful surgical operation for detached retina had been performed.
†Obviously, many eyes had more than one complicating factor.

around the tears. Then the subretinal fluid is drained by perforating pins or a drain. If a scratch-through drain is used, it must be closed with a suture before implanting the vitreous so as to withstand the vitreous pressure, thus preventing a retinal hernia.

The pars plana base in the previously prepared vitreous sclerotomy is then touched with diathermy to prevent bleeding. A half knot is loosely placed in each mattress suture, and the assistant picks up the arms of the sutures, one pair in each hand. An 18-gauge sterile needle on a syringe containing 4 cc. of sterile vitreous is inserted between the sutures into the eye. The tip of the needle must be kept posterior to the lens, if it is present, and not in a retinal bulla, if present. This can be determined by watching the needle through the pupil. The vitreous is injected slowly until the eye becomes hard. The proper tension can be estimated by touching the eye with a muscle hook, or it can be ascertained when a reading of 40 Schiøtz is obtained on a tonometer. The elevated pressure is held for two minutes. During this time subretinal fluid is usually streaming from the drainage outlet. The assistant may have to pull up on the mattress sutures to prevent leakage around the needle. The eye is then permitted to drop to a high normal tension either naturally or by slight aspiration with the syringe plunger, and the needle is withdrawn with the sutures taut. The suture closest to the needle is then taken from the assistant's hand, still taut, and tied with three knots. The second mattress suture is then tied. A ring of nonperforating diathermy is placed around the implant site, and the muscles and conjunctiva are replaced.

RESULTS

The results of the vitreous implant for retinal detachments that have not been corrected by previous surgical intervention undertaken at least once are presented in tables I and II. Table I presents the results obtained in relation to the preoperative status or major complications of the case.

The over-all results of the 72 vitreous implants in 64 eyes showed 29 successes, representing 40 per cent of the operations and 45 per cent of the eyes operat-

ed on. The difference between the number of eyes operated upon and the number of operations is due to the fact that two eyes had three vitreous implants and four eyes had two vitreous implants each. Of the two eyes that had three implants, the retina in one is still detached; the retina in the other has been attached for over a year and the eye has 20/15 vision.

The reattachment of a retina is, of course, desirable, but from the patient's point of view, the vision obtained is the most important result. Table II presents the visual results in this series of previous failures.

TABLE II

VISUAL RESULTS IN EYES IN WHICH THE RETINA WAS REATTACHED BY VITREOUS IMPLANTS

VISION	NUMBER OF EYES	PERCENTAGE OF EYES
20/15 to 20/40	7	24
20/50 to 20/100	9	31
20/200	10	35
Less than 20/200	3	10
Total	29	100

COMPLICATIONS

No presentation of a technique for reattaching retinas should omit a clear statement of the price paid in eyes that have had repeated or multiple operations. In fact, the number of eyes that go on to phthisis or degeneration after major scleral resections by good surgeons, with or without inclusion of tubing, has made worth while the vitreous implant research.

Not one eye of this series of 72 consecutive vitreous implants has yet come to enucleation, whether the procedure was successful in attaching the retina or not. Only one case approaches it; now seven years postoperatively the patient has a complicated cataract and episodes of tension, with rubeosis iridis. This elderly woman, however, had a reattached retina for six years with serviceable vision and a good field.

Four other cases had lesser complications: one case of easily controlled glaucoma, with the same problem existing in the unoperated eye; one case of cataract in an elderly woman, with equivalent senile lens change in the unoperated eye; one case of recurrent tension episodes and vitreous hemorrhages, but the same things occurred preoperatively; one case of a star-shaped retinal fold at the drainage site with moderate superficial retinal hemorrhage. There was no massive vitreous hemorrhage, no panophthalmitis and no uveitis. The only undesirable characteristic of the vitreous implant has been a moderate vitreous haze which has lasted from three to ten days postoperatively.

COMMENT

The vitreous implant is not presented as the final cure-all of retinal detachments but rather as one more way that we can successfully care for the more complicated detachments with little likelihood of lost or inoperable eyes if it fails. It is easier and quicker than a major resection or buckle, but it has produced good results in 45 per cent of cases previously operated upon unsuccessfully, and, most significantly, this has been done without loss of an eye. Of particular interest was the fact that 60 per cent of the detached retinas treated by vitreous implant after a previous scleral resection was unsuccessful became reattached. One of these more hazardous procedures can be used when the simpler but still effective procedures have failed. For my own part, a total gastrectomy would undoubtedly solve my indigestion, but I would prefer other methods first.

Each detachment can be weighed as to the most desirable procedure to follow. In the scales should be the chances of success and the chances of an inoperable failure or lost eye. On the basis of the results, a choice can then be made from the following procedures: simple diathermy, vitreous implant, scleral resection, and scleral buckle.

Of particular interest has been the behavior of the vitreous itself. It appears to be completely inert and to be completely acceptable to the recipient eye. These eyes show no more reaction than occurs after an extensive diathermy. They whiten quickly, and no more pain or discomfort is produced than that following the usual intraocular operation. There has been no difficulty with vitreous in the anterior chamber in patients with aphakia. Optically, the vitreous becomes clear after the initial few days of haze, and it produces no significant change in the refraction. The cases in this series, together with those included in other studies, show that vitreous may be implanted, transplanted, withdrawn and replanted with impunity in the human eye.

CONCLUSIONS

1. Sterile pooled human vitreous may be aspirated from donor eyes and stored for at least seven years without apparent change.

2. Seventy-two vitreous implants were performed on 64 eyes with complicated retinal detachments that had previously been unsuccessfully treated with retinal surgery.

3. The retina was reattached in 29 of the 64 eyes, giving a reattachment rate of 40 per cent for the vitreous implant operation.

4. The complications resulting from the vitreous implant were minimal.

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DISCUSSION

DOHRMANN K. PISCHEL, M.D., San Francisco: I wish to congratulate Dr. Shafer on his presentation of this interesting subject. His differentiation between his own implant and vitreous transplant as described by others for massive vitreous hemorrhage and vitreous opacities is, I believe, well taken. I believe, further, that all will agree that this substance which we have obtained from a donor eye, kept in a refrigerator for days, and then injected through a hypodermic needle is not unaltered vitreous. It is, as Dr. Shafer described it, a nearly colorless, oily, viscous and apparently inert fluid. However, for sake of definition and clarity, I agree it should be spoken of as vitreous.

Stimulated by Dr. Shafer's work, I have used this method of vitreous implant and have been favorably impressed by it. Previously, I had always felt and said that either saline solution or air was as good for injection into the vitreous cavity as any of the more complicated substances, such as vitreous and spinal fluid. I now am happy to say that I was wrong. I firmly believe that vitreous is definitely superior to saline solution in all respects, and in most respects it is superior to air.

To take up its drawbacks first, the fact that it is not readily available in most hospitals is a handicap. The only other drawback is that when injected in the presence of large tears, I believe it will flow out through them and through the scleral drainage holes as fast as it can be injected. (This is also true of saline solution and sometimes true of air.) With smaller tears, its viscosity seems great enough that there is definite impedence to its outflow, so that it has the desired tamponading effect mentioned by Dr. Shafer. Therefore, it seems to me that if one found no increase in the tension of an eye with large tears while performing a vitreous implant, it would be well to add air injection to the procedure. The air might also get through these tears, but in my hands it has seemed much less likely to do so. It seems to form a film over the retinal breaks and balloons out inside the retina in a manner remindful of soap bubbles. In this way, the air would help press the retina back into position.

We have not had so fortunate an experience with the self-sterilizing quality of this vitreous as has Dr. Shafer. Several of our samples of vitreous gave positive cultures for various bacteria (undoubtedly contaminants), and on repeat cultures several again were positive. I would, therefore, highly recommend great care and regular cultures of the newly obtained vitreous.

Careful following of Dr. Shafer's technique is of great importance. That this is especially important about the placing of the double mattress suture around the 18-gauge injection needle was learned to our sorrow when we neglected this. The result was that considerable valuable vitreous was lost as it regurgitated back past the needle shaft.

My associates and I have changed to using a much smaller needle. We found that we could easily inject this donor vitreous through a no. 27 needle. Another thing we have learned is that if it is at all possible, the needle should be introduced through fresh sclera. In previously diathermized sclera, the needle during the manipulation of vitreous injection may tear a hole in the sclera big enough to lose some of the intraocular contents, either host or donor vitreous, in spite of the sutures, which hold poorly in such friable sclera.

Dr. Shafer feels that injected vitreous acts chiefly as a mechanical replacement for the host vitreous, and as a bulwark to keep the retina pressed against the choroid. I agree that it helps in this way; but I have a tentative theory that it also acts favorably in another way. I believe that it has some sort of lytic action on the host vitreous, or on the strands in the vitreous cavity, causing them either to disappear or to loosen their faulty attachment to the retina.

This theory seems supported by the following clinical experiences. We have seen cases of almost immediate improvement and cure after a vitreous injection combined with subretinal drainage, or additional diathermy, or scleral resections, or any combination of these procedures. We have also several cases with vitreous strands, or marked vitreoretinal adhesions, in which the early postoperative result was poor. However, in the course of three to four months, four of these cases came to a complete retinal reattachment. This, I believe, was due to the delayed lysis of the vitreoretinal adhesions.

It is, of course, difficult to be certain in cured cases which factor has helped most in cases operated upon more than once; but Dr. Shafer's percentage of 45 per cent cures in reoperations is much higher than that in most series I know. Therefore, considerable credit must be given to the vitreous implant for these successes. My opinion about the whole procedure is best expressed by the fact that in difficult cases of retinal detachment that have not yielded to surgical intervention, I am including the feature of vitreous implant as often as feasible. Again, I want to thank Dr. Shafer for stimulating interest in this important subject.

GRAHAM CLARK, M.D., Englewood, New Jersey: In retrospect, it seems strange that despite the fact that the vitreous has been recognized as the chief causative agent in retinal detachments ever since the paper of Leber in 1889, no one until now has effectively attacked a retinal detachment through the vitreous.

Vitreous has been transplanted into the human eye before. Deutschman successfully transplanted both sheep and rabbit vitreous into human eyes in 1906, and Cutler in 1946 reported successful and effective transplantation from one human eye to another, but both of the attempts were made in an effort to combat the opacification of the vitreous by blood.

No one, to my knowledge, has attempted this highly effective method of treating detachments before Dr. Shafer; yet, on the very surface of the idea, the logic of its use is so apparent as to be inescapable.

I had followed Dr. Shafer's work with great interest for several years during which period I was working with the replacement of the lost vitreous by air and other gases. A little over a year ago I became convinced

that his method was superior to any that I was using, and began to do vitreous implants and transplants.

Despite Dr. Shafer's unfailing generosity in sharing the vitreous which he got from the Eye Bank, the supply was only sufficient to use on selected desperate cases. The series is too small for significant report, but my results agree with those he has reported and have been most gratifying.

It must, of course, await laboratory confirmation, but clinical observations indicate that not only does the injection of normal vitreous effectively replace that lost as subretinal fluid and hold the retina in place, but, of more importance, it seems to attack and reverse the active mechanism in the vitreous of the affected eye. In short, perhaps we are at last about to find and attack the basic cause of retinal detachments.

(In this connection we have observed that on a few occasions the injected vitreous has seemed to have none of the expected actions. I wonder if Dr. Shafer would comment on the possibility that the donor vitreous might not be normal despite the fact that it was removed from an eye which had not had a detachment.)

In closing, I should like to stress one point which Dr. Shafer has mentioned. Vitreous is uniformly sterile after 48 hours at 40° F., but it must be cultured before use. In our series we have had only one positive culture, that from vitreous taken directly from the donor eye. After 48 hours' refrigeration it was again cultured and found to be sterile.

I want to thank Dr. Shafer for allowing me the honor of commenting on this paper, which I feel sure will stand as a milestone in the treatment of retinal detachments.

DR. SHAFER: First of all, I wish to thank very sincerely both Dr. Pischel and Dr. Clark for their time, thought, and criticism.

Dr. Pischel mentioned the availability of vitreous. It got so for a while in New York that we were accusing each other of hijacking. I would walk into the Eye Bank. No vitreous. Somebody had beat me to it. All vitreous used in the cases for this presentation came from eyes donated to the Eye Bank for Sight Restoration. The use of vitreous from autopsy cases, I believe, is basically a legal decision. Upon the findings of the counsel or the lawyer for your institution depends the decision whether or not vitreous can be considered one of the body fluids, and whether at the time of autopsy it can be withdrawn as other bodily fluids are. It depends upon your relation with the pathologist and the legal situation at your place of work. We have not used cadaver vitreous.

Dr. Pischel also made the point that the implanted vitreous may short circuit through large tears and go out through the drain. That very definitely can happen. When it first happened to me, I felt that this procedure would undoubtedly fail. After it had happened several times, we found that these cases were not all failures. It may short circuit, yes, but one method that seems to reduce that likelihood, as I mentioned, is to plant the vitreous 180 degrees from the major tear, and to keep the needle tip forward within the hyaloid so that there is some tampon effect from the patient's remaining vitreous framework.

The question of the culture of vitreous is, of course, fundamental. The vitreous must be sterile. I am very much interested in Dr. Pischel's experience and certainly will review our own culture methods. I am very thankful that Dr. Clark's findings parallel ours; this is, nevertheless, a fundamental point, and the refrigeration interval appears essential.

I have not used the smaller needle mentioned by Dr. Pischel. It certainly would be easier to get through into the eye, but Dr. Clark's comment that it results in reduced viscosity should be kept in mind.

PRERETINAL AND OPTIC NERVE-SHEATH HEMORRHAGE: PATHOLOGIC AND EXPERIMENTAL ASPECTS IN SUBARACHNOID HEMORRHAGE

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PRERETINAL hemorrhage is generally recognized as a rather characteristic ophthalmoscopic finding in patients suffering subarachnoid bleeding. The hemorrhages occur most frequently near the optic disc, but they may occur at varying distances toward the periphery. They are usually multiple and bilateral but may be unilateral and solitary.

Hemorrhage into the optic nerve sheath is not generally recognized because of its ophthalmoscopic inaccessibility; however, it may be equally as common as preretinal hemorrhage. Another factor that perhaps adds to the lack of better understanding of hemorrhage into the nerve sheath is that often the intraorbital portion of the optic nerve is not inspected in the usual routine necropsy.

Our interest in these hemorrhages, especially those of the nerve sheath, has been stimulated recently by the frequent finding, at necropsy, of unsuspected hemorrhage into the nerve sheath in patients who did not survive an episode of subarachnoid bleeding.[19] Our curiosity has been aroused as to how the blood got into the nerve sheath. A seemingly reasonable explanation is that it is merely a forward extension of intracranial subarachnoid hemorrhage that has passed into the sheaths of the optic nerve.

When we studied the necropsy material of such cases, however, we were impressed with the possibility that the nerve-sheath hemorrhages result from increased venous pressure secondary to sudden increased intracranial pressure, as is thought to be true of the preretinal hemorrhages. We have evaluated this hypothesis by pathologic study and have tested it in experimental animals.

PREVIOUS REPORTS AND INVESTIGATIONS

The earlier concepts concerning the origin of preretinal hemorrhages and hemorrhages into the nerve sheath, as revealed in the articles written on this subject, are interesting. It seems only natural that the early investigators would surmise that preretinal hemorrhage was a part of intracranial subarachnoid hemorrhage that had, in some manner, extended forward and entered the globe. This seems to have been the

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assumption of most of the writers during the early years of the twentieth century.

Probably the first recorded observation expressing this view is that of White[19] in 1895. He expressed the opinion that the hemorrhage into the retina was caused by blood that had passed forward in the optic nerve sheath and "tore its way forward under the retina." Doubler and Marlow[6] in 1917 reported a case in which intraocular hemorrhage and nerve-sheath hemorrhage were thought to have been pushed forward from the intracranial hemorrhage. Paton[15] in 1924 stated that hemorrhage spread down the nerve sheath and also that the preretinal hemorrhage represented blood that had spread through the lamina from the nerve sheath. Symonds,[17] about this same time, expressed a similar view in discussing spontaneous subarachnoid hemorrhage.

De Schweinitz and Holloway[5] reported a case of hemorrhage into the retina and sheath of the optic nerve in 1914 and proposed two possibilities regarding its occurrence. The first was that it was the result of direct extension, and the second was that it was caused by a fracture of the optic foramen. The latter explanation seemed plausible, since the intracranial bleeding in their patient resulted from a fractured skull.

In later articles concerning this subject most authors held the opinion that the nerve-sheath hemorrhage was a forward extension of intracranial bleeding; they realized, however, that the intraocular hemorrhage could not arise in this manner and that it was, therefore, a separate secondary hemorrhage.

Riddoch and Goulden[16] pointed out in 1925 that the concept of blood passing from the subarachnoid space of the optic nerve into the eye through the lamina cribrosa is anatomically impossible. They called attention to the blind ending of the subarachnoid space of the optic nerve as it enters the globe, which should halt the forward passage of blood. They expressed the view that the intraocular hemorrhage resulted from obstruction of the central retinal vein at the point where it pierces the nerve sheaths in its exit from the optic nerve.

In 1931, MacDonald,[11] in describing ocular lesions caused by intracranial bleeding, stated that intraocular hemorrhages were not forward extensions of hemorrhage along the nerve sheath. He thought that intraocular hemorrhages were produced on a mechanical basis of venous rupture due to back pressure brought about by the sudden abnormally elevated intracranial pressure.

In more recent years Greear,[9] Drews and Minckler,[7] and Miller and Cuttino[14] have maintained that intracranial hemorrhage and hemorrhage into the optic nerve sheath were continuous, although they expressed the opinion that the intraocular hemorrhages were independent.

At the present time, Manschot[12] and his co-worker[13] seem to be alone in contending that optic nerve-sheath hemorrhage results from extension of intracranial bleeding and that this nerve-sheath hemorrhage in turn somehow produces intraocular bleeding.

Ballantyne[1] is usually given credit for stressing the idea that optic nerve-sheath hemorrhage as well as intraocular hemorrhage is an independent hemorrhagic phenomenon that has no direct continuity with the intracranial subarachnoid bleeding. According to this theory, the hemorrhages are related only in that the intracranial hemorrhage produces secondary bleeding into the nerve sheaths by suddenly raising the intracranial pressure.

In 1951, Walsh and Hedges[18] concurred in this opinion of Ballantyne. By

serial sections of the optic nerves and sheaths in eight cases of spontaneous intracranial hemorrhage, they were able to demonstrate that hemorrhage in the sheaths was not continuous with that in the intracranial cavity.

Cordes[3] reported three cases of subhyaloid hemorrhage after subarachnoid bleeding and accepted the contention of Ballantyne that the hemorrhage into the eye and nerve sheath is the result of venous pressure transmitted from the intracranial cavity to the orbital veins.

Bisland and Topilow[2] reported an interesting case of subarachnoid hemorrhage. The fact that their patient had hemorrhage into the third ventricle from a rare aneurysm in this area instead of in the more usual location nearer the optic canals, seemed to them to lend support to the theory that ocular hemorrhages are secondary to suddenly elevated intracranial pressure. They felt that necropsy in their case demonstrated a lack of continuity between intracranial bleeding and orbital bleeding.

Hedges and Walsh,[10] in a more recent article, reported an interesting case demonstrating an unusual complication of angiocardiography. The patient had died following injection of 22 cc. of 70 per cent iodopyracet intra-arterially. Profuse optic nerve-sheath hemorrhage invading the subdural and subarachnoid spaces, as well as massive subhyaloid hemorrhage, was found at necropsy. The authors concluded that these pathologic findings show dramatically that isolated nerve-sheath and intraocular hemorrhages may occur in the absence of intracranial bleeding. They further conclude that isolated venous hemorrhages occur as a result of intracranial venous stasis when intracranial pressure increases rapidly.

FIG. 1—Large preretinal hemorrhage occurring with a ruptured intracranial aneurysm.

PATHOLOGIC STUDIES OF CLINICAL MATERIAL

The patient who initially aroused our interest in this subject was a 44-year-old man who entered a hospital in Rochester, Minnesota, on December 27, 1953, with a diagnosis of subarachnoid hemorrhage. He had suffered a sudden onset of significant symptoms shortly before his admission, and although he had complete third-nerve palsy on one side, he did not have any preretinal hemorrhage. The day after admission he had a recurrent subarachnoid hemorrhage and died within a few hours.

At necropsy, gross bleeding from a ruptured congenital aneurysm of the right posterior communicating artery was found. The posterior segments of both globes along with the optic nerves, were removed, and in the left eye a large preretinal hemorrhage covering the optic nerve head was found (fig. 1). Since

this hemorrhage was not present on the preceding day, the logical conclusion was that it had developed suddenly, probably at the time of the second intracranial hemorrhage.

Microscopic sections of the globe show the preretinal hemorrhage (fig. 2). In addition to preretinal bleeding, gross bleeding had occurred into the nerve sheath. Microscopic cross section of the nerve and nerve sheaths (fig. 3) showed the blood mainly in the subarachnoid region.

This subarachnoid location of the blood suggested that it might have entered the sheath from the intracranial cavity by way of the optic canals. It was noted, however, that there seemed to be less blood in the proximal portion of the optic nerve than in the distal retrobulbar portion. Bleeding into the optic nerve was noted also in one section (fig. 4). Perhaps blood could be forced into the nerve from the subarachnoid spaces, but this seemed unlikely. It seemed more likely that hemorrhage had occurred in the nerve and nerve sheaths independently, just as it had in the interior of the eye, rather than that it had been a direct continuation of intracranial subarachnoid bleeding.

After studying other similar cases, we became more convinced that the hemorrhage arose in the nerve sheaths. Figure 5 shows a preretinal hemorrhage occurring in a 56-year-old woman who was found at necropsy to have a ruptured aneurysm of the anterior communicating artery. As can be seen in figure 6, the hemorrhage of the nerve sheath is subdural instead of subarachnoid. This is difficult to explain as an extension of bleeding in the intracranial subarachnoid space.

Figure 7 shows a specimen from another patient in whom the nerve-sheath hemorrhage was entirely subdural. This patient's subarachnoid hemorrhage was due to a gunshot wound—not to a ruptured aneurysm, but intracranial bleeding was extensive and included bleeding into the subarachnoid spaces and ventricles. In another patient dying of a ruptured aneurysm of the left internal carotid, the nerve-sheath hemorrhage was also found to be subdural and not subarachnoid (fig. 8).

One of the most interesting hemorrhages from the standpoint of location was an intradural nerve-sheath hemorrhage (fig. 9). The hemorrhage occurred in the dura of the optic nerve of a 52-year-old woman, who died as a result of a ruptured aneurysm of the right posterior communicating artery. This seemed to us rather conclusive evidence that bleeding occurred independently, since we could not conceive of blood forcing its way into the tough dural sheath if it had come forward along the subarachnoid space. In addition, blood was not evident in the subarachnoid space of the optic nerve in this patient.

Clinically, preretinal hemorrhages, recognized as occurring typically in conjunction with subarachnoid hemorrhage, are not always due to ruptured aneurysms. They may occur in subarachnoid hemorrhage from any cause. It was not surprising, therefore, to find in such patients, also, hemorrhage of the optic nerve sheath. One patient, who had suffered a hypertensive intracerebral hemorrhage in which the blood had broken into the ventricles, was found to have both preretinal and optic nerve-sheath hemorrhage. Blood was found in the nerve sheaths of a patient dying after an operation for pituitary tumor. Whatever the cause of the subarachnoid bleeding, the pathologic picture, just as the clinical ophthalmoscopic picture, is the same.

The pathologic evidence in these patients seemed rather conclusive that hemorrhages into the nerve sheath were

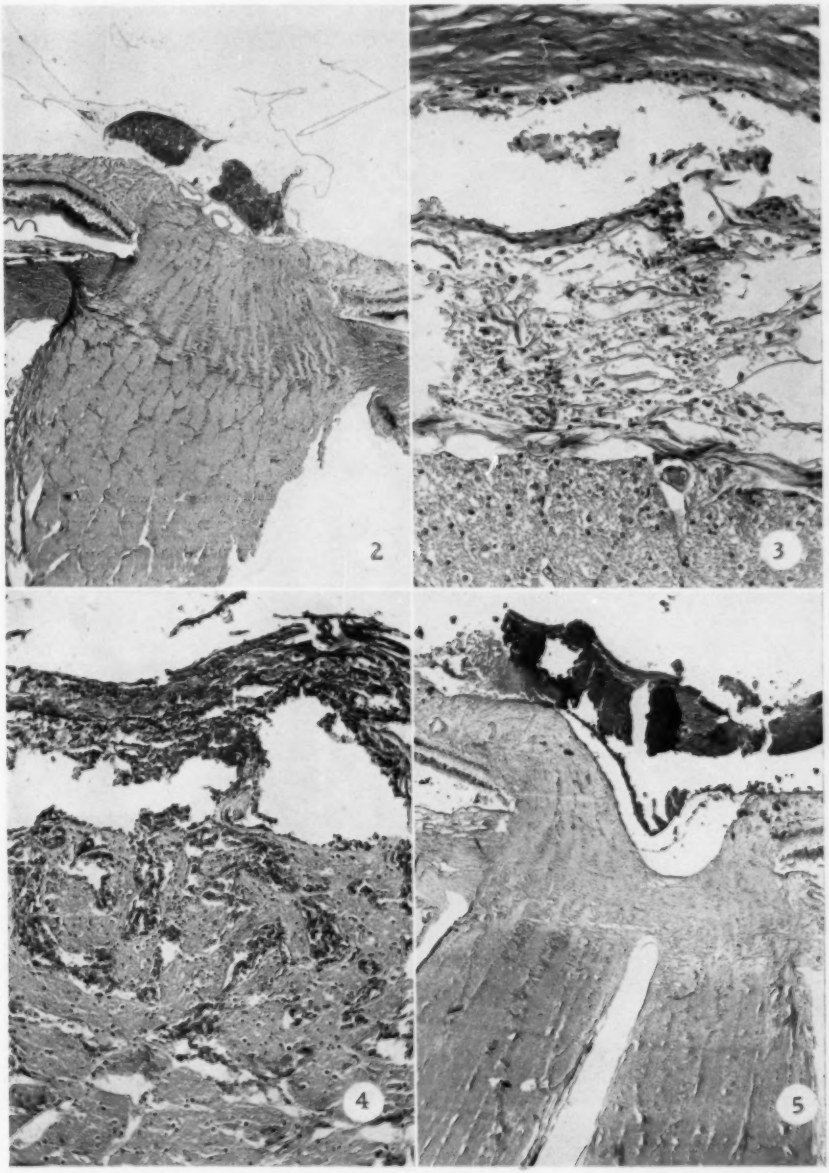

FIG. 2—Preretinal hemorrhage shown in figure 1.

FIG. 3—Subarachnoid location of hemorrhage in the optic nerve sheath in the same case as figures 1 and 2.

FIG. 4—Optic nerve (same as in figure 3) showing hemorrhage into the nerve substance.

FIG. 5—A large preretinal hemorrhage occurring in patient with a ruptured intracranial aneurysm.

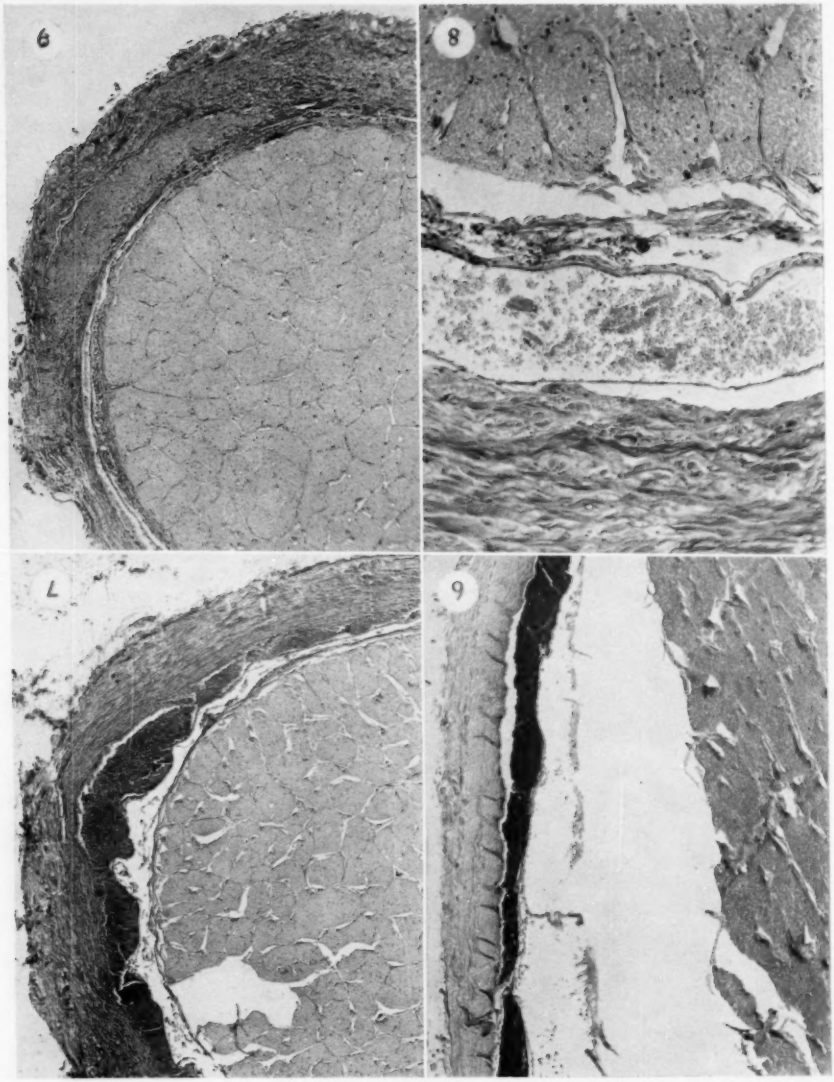

FIG. 6—Subdural location of hemorrhage of the optic nerve sheath in the same patient as figure 5.

FIG. 7—The subdural location of hemorrhage of the optic nerve sheath associated with intracranial bleeding from a gunshot wound of the head.

FIG. 8—Subdural location of hemorrhage of optic nerve sheath in patient with a ruptured intracranial aneurysm.

FIG. 9—Intradural hemorrhage of the optic nerve sheath in a patient with a ruptured intracranial aneurysm.

independent and not a forward extension of the intracranial hemorrhage. This evidence was as follows: (1) hemorrhage in the nerve sheaths did not appear to be continuous in some cases, being found only in the distal retrobulbar portions, (2) blood in the sheaths seemed to be subdural more often than subarachnoid, and (3) blood was found intradurally and in the optic nerve in a few cases. These points make it difficult to conceive of a mechanism of forward extension.

The pathologic studies do not give a clue as to the cause for hemorrhage into the sheaths, but the logical conclusion seems to be that it is due to sudden increased venous pressure. It is interesting to note that the combination of intracranial subdural hematoma and ruptured aneurysm is occasionally observed by the clinician. Also, the combination of intramedullary brain-stem hemorrhage and ruptured aneurysms may be seen at necropsy by the pathologist. Perhaps these also are similar hemorrhagic manifestations of the sudden increase in intracranial pressure caused by subarachnoid bleeding.

EXPERIMENTAL STUDIES

If the theory of independent origin of nerve-sheath hemorrhage is valid, it seemed that it should be possible to produce such hemorrhages experimentally. In order to prove that the hemorrhage actually was due to increased intracranial pressure, blood should not be allowed to enter the subarachnoid space. In the laboratories at the Mayo Clinic a method for suddenly increasing the intracranial pressure in the subarachnoid space of animals was devised.

The laws of hydraulics state that any pressure exerted in any part of a fluid system is transmitted equally throughout that system. Therefore, it should make no difference to which portion of the subarachnoid space the pressure is applied. The cisterna magna is the most readily available and technically the most easily accessible approach; it seemed, therefore, to be the logical point of attack. The distance from the optic foramen and optic nerves was an added advantage in that artefacts might be more easily avoided.

The methods of Cushing and Bordley[4] and of Freeman and Jeffers[8] were used to perform a series of experiments on dogs. The dogs were anesthetized with an initial dose of 25 mg. of pentobarbital sodium (Nembutal®) per kilogram of body weight given intravenously. Additional anesthetic was given as needed to maintain anesthesia. The femoral artery was cannulated so that the blood pressure might be recorded on a kymograph during the procedure. The blood pressure responses were the best index as to the changes of pressure in the subarachnoid space. The kymograph record also afforded a convenient means of keeping a chronologic sequence of events during the experiments. The trachea of each animal was intubated so that artificial respiration could be supplied when needed. A 1 per cent solution of atropine was instilled in each eye to produce pupillary dilatation. A 20-gauge needle was inserted into the cisterna magna and connected to a reservoir of sterile saline solution; thus pressure could be controlled at will by raising and lowering the flask a measured amount.

Saline solution at a pressure of 200 mm. of mercury was admitted suddenly into the subarachnoid space. As reported by Freeman and Jeffers, a pressure of this magnitude causes an instantaneous and precipitous rise in the blood pressure. The mean blood pressure made a steep rise from systolic normals ranging from 120 to 150 to more than 300 mm. of mercury. Immediately the animals became rigid; the eyes rotated down-

ward, and after about 40 seconds apnea occurred, with resumption of breathing after 60 to 90 seconds.

Nine dogs were used and various pressures and durations of pressure were employed. The pressure exerted varied from 50 to 300 mm. of mercury, and the time that the pressure was applied varied from 30 seconds to continuous application until death of the animal resulted.

Increase in the intracranial pressure produced an engorgement of the retinal veins concurrent with the increase in pressure. The degree of engorgement seemed to be roughly proportional to the pressure of the saline solution. This engorgement seemed to be sufficient to rupture a retinal vein; however, this did not occur. One small retinal hemorrhage did occur in one dog, but it could hardly be thought to be significant. No optic nerve-sheath hemorrhage could be found on histologic section. It is interesting to add that no papilledema was detected ophthalmoscopically or histologically in any of the nine dogs.

These results led to the conclusion that the theory regarding the production of the hemorrhages was wrong or that some anatomic or physiologic difference existed in the intracranial and ocular vascular connections of the dog and the human. With the latter possibility in mind, the rhesus monkey was chosen as the animal that should most nearly approach the human being in its anatomic and physiologic relationships.

The same technique as that used with the dogs was employed in two monkeys. In one monkey no hemorrhage occurred, while in the other a large preretinal hemorrhage appeared alongside the optic disc as well as several other smaller streak hemorrhages. These hemorrhages were produced with the use of a pressure of 200 mm. of mercury. The pressure was maintained for one minute and then released. The veins of the retina engorged immediately on increase of the cerebrospinal pressure, the animal became rigid in a few seconds, the eyes rotated strongly, and the animal became apneic. On the third increase of pressure, the hemorrhages described appeared in the right eye of the animal. A photograph of the fundus (fig. 10) was taken, and the monkey was allowed to recover.

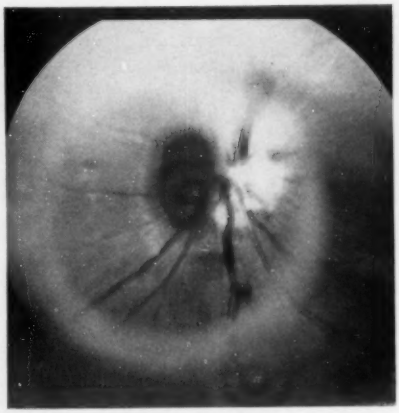

FIG. 10—Fundus of a monkey showing an experimentally produced preretinal hemorrhage.

The animal was observed for twenty-four hours, and although it was able to sit alone, it never became very active. The fundus did not show any appreciable change. An overdose of anesthetic agent was given, and following death of the animal, necropsy was carried out. The optic nerve sheath on the right had a slight hemorrhagic appearance, but microscopic sections were necessary to ascertain that hemorrhage had actually occurred. The hemorrhage was confined to the subdural space (fig. 11). Microscopic section of the globe (fig. 12) shows the preretinal hemorrhage observed with the ophthalmoscope.

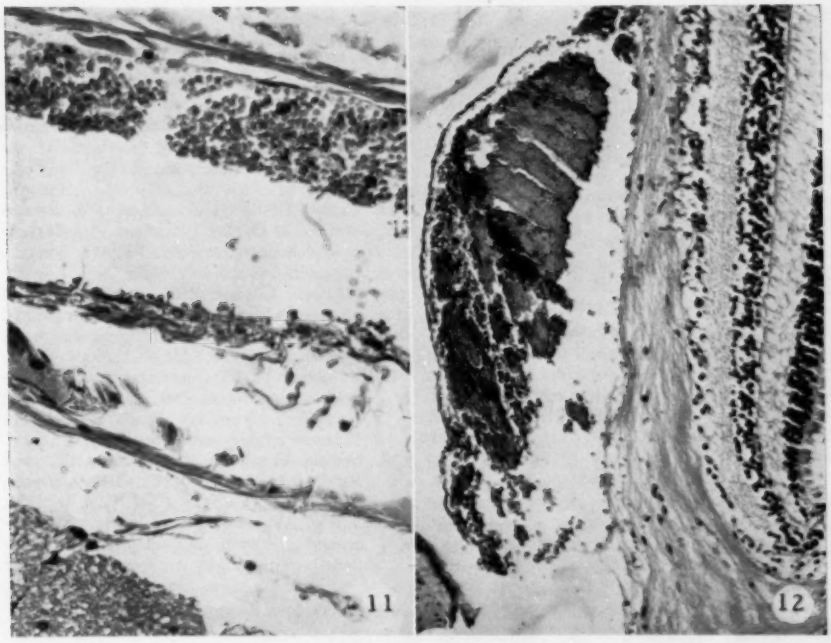

FIG. 11—Subdural location of the experimentally produced hemorrhage in the optic nerve sheath of a monkey.
FIG. 12—Experimentally produced preretinal hemorrhage in a monkey. This is the same hemorrhage seen grossly in figure 10.

SUMMARY AND CONCLUSIONS

A review of the literature reveals the present concept to be that both intraocular hemorrhages and hemorrhage into the optic nerve sheath seen in patients with subarachnoid hemorrhage are separate, independent hemorrhages. They do not arise from an extension of intracranial bleeding but occur at the site mentioned probably as a result of increased venous pressure secondary to sudden increased intracranial pressure.

The pathologic study reported in this paper also substantiates this concept. The facts that hemorrhage into the nerve sheath in these cases was most often subdural rather than subarachnoid, that it was found at times in the dura and optic nerve, and that it did not involve the entire nerve sheath seemed to refute the argument that it resulted from intracranial extension. After studying these cases, there seemed to be no question that hemorrhage of the nerve sheath arose in and from the sheaths themselves just as preretinal hemorrhage arose in and from the retina.

The experimental production of preretinal hemorrhage, and hemorrhage into the optic nerve sheath of the rhesus monkey, by injecting saline solution into the subarachnoid space, thereby suddenly increasing the intracranial pressure, would seem to confirm this theory.

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DISCUSSION

FRANK B. WALSH, M.D., Baltimore, Maryland: During 1949 and 1950 Dr. Thomas R. Hedges and I worked on problems concerning optic nerve-sheath hemorrhages. Our findings confirmed what Ballantyne had described, namely that for the most part, orbital optic nerve-sheath hemorrhages do not result from the passage forward of blood from the cranial cavity. We are pleased that the clinical and experimental studies here reported confirm and amplify our observations.

Dr. Hedges and I think that it is wrong to state that optic nerve-sheath hemorrhage causes blindness. We have found extensive nerve-sheath hemorrhages in individuals who during life retained normal vision. If the case is one of injury, loss of vision is best attributed to trauma to the nerve, whether or not optic nerve-sheath hemorrhages are present.

A sudden rise in pressure is necessary in order to produce optic nerve-sheath hemorrhages. Such a sudden rise in venous pressure explains hemorrhage that occurs within the third nerve and chiasm, as we have observed in cases of subarachnoid hemorrhage.

In the instance of intraocular hemorrhage, there is general agreement that the blood is venous. Why does it develop around the optic

disc? Probably this is because at this site the veins have less support than elsewhere. Probably on the same basis we have observed intradural hemorrhage just at the orbital opening of the optic canal.

Finally, it has been reasonably established that subdural and subarachnoid hemorrhages of the optic nerve sheaths are separate and distinct, although both may be seen in the same individual.

WINDSOR S. DAVIES, M.D., Detroit, Michigan: For many years, investigators have sought an explanation for the mechanism involved in the development of hemorrhages in the sheaths of the optic nerve and in the retina in cases of subarachnoid hemorrhage. Our essayist has given us a brief historical review of this subject, bringing to our attention a change in concept relative to the cause of these hemorrhages, this change in concept being due mainly to careful pathologic investigations contributed by several authors.

Published reports of the incidence of papilledema and retinal hemorrhages in subarachnoid hemorrhage show marked variation. Can this variation be due, in some cases at least, to inadequate ophthalmologic examinations? Can one draw a definite line of demarcation between those vascular accidents in the retina and optic nerve that are due to systemic causes and those due to subarachnoid hemorrhage? Pathologic studies of the eyeball in cases of subarachnoid hemorrhage have shown a variety of changes, including congestion of the retina and choroid, and small to massive hemorrhages in front of and behind the retina, as well as intraretinal and optic nerve hemorrhages. Certainly the clinical interpretation of the fundus findings is of paramount importance in such a statistical survey. When reviewing cases of subarachnoid hemorrhage, it is not unusual to find nothing recorded in the report of the physical examination relative to the fundus findings, or possibly to find that a note is made stating that the fundus was not visualized. Where a note is made relative to the eye findings, it is quite often brief and nondescriptive. Might not one expect a large variation in the reported incidence of hemorrhage and papilledema in subarachnoid hemorrhage.

I have recently reviewed the clinical records of one hundred patients with subarachnoid hemorrhage in which the ophthalmological findings were described. Nineteen per cent demonstrated retinal hemorrhages, and 9 per cent showed papilledema of a mild to moderate degree. Five of the 9 patients with papilledema had retinal hemorrhages. The incidence of retinal hemorrhages and papilledema in this series of cases of subarachnoid hemorrhage is less frequent than in series reported by others.

A clarification of the mechanism involved in the production of these hemorrhages has been hampered in the past by the lack of material made available for pathologic examination. When such cases come to necropsy, the optic nerve and whole eyeball or posterior segment are not usually obtained for examination unless specifically requested. Thus a clarification of the character and distribution of these hemorrhages within the eyeball and orbit has only slowly evolved.

The presence of an anatomical connection between the subarachnoid space of the brain and the optic nerve has been definitely established by histologic examination. One must then assume that blood can pass the barrier of the optic canal and reach the subarachnoid space in the optic nerve. The presence of blood in the subarachnoid space in the optic canal has been demonstrated by pathologic examination in cases of subarachnoid hemorrhage. The pathologic examination of the specimens of our essayist and other investigators, however, certainly points to the probability that both intraocular and extraocular hemorrhages are individual ones rather than an extension of hemorrhage directly from the subarachnoid space of the brain; that a crisis occurs in which there is a sudden increase in intracranial pressure producing an increased venous pressure of such magnitude that veins are ruptured and hemorrhages occur in the retina, in the optic nerve and its sheaths, and in the orbit.

Drs. Smith, Kearns and Sayre are to be congratulated on their excellent and convincing presentation. Their findings mark another advance in the gradual evolution of the mechanism involved in the production of these hemorrhages.

THE BULBAR CONJUNCTIVAL LYMPHATICS AND THEIR CLINICAL SIGNIFICANCE

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Continued dissatisfaction with the handling of cases of conjunctival lymphangiectasia instigated this investigation of the lymphatics of the bulbar conjunctiva in normal eyes and in those with abnormalities of these vessels. By means of vital staining by the method of Busacca[2] it has been possible to study these vessels and to evaluate the work of Busacca and others, as well as to add observations of our own. This information has led to a study of methods of treating lymphangiectasia in the bulbar conjunctiva and to a brief investigation of the means by which therapeutic substances injected subconjunctivally may enter the cornea and anterior chamber.

The first observation of the lymphatic vessels of the bulbar conjunctiva was made in 1847 by Arnold.[1] However, the classical studies on the lymphatics were made by Teichmann,[19] who described a rich network, 1 mm. wide, of tiny vessels surrounding the edge of the cornea. He called this the "circulus lymphaticus." On the corneal side, the vessels ended as arcades; while on the side away from the cornea, the vessels interlaced with the lymphatics of the conjunctiva overlying the sclera, which radiate from their origin 4 or 5 mm., then tend to become concentric with the corneal margin. Main lymph channels then pass from the nasal areas to the temporal areas and to the external angles. Teichmann's description was confirmed by Schmidt,[14] Fuchs,[5] Klein,[7] Waldeyer,[21] Leber,[10] Most,[11] Stübel,[15] Orts Llorca[13] and Busacca.[2]

Orts Llorca described the main collector channels as two in number; one superior, the other inferior. Both were described as going laterally toward the external angle; the superior one winding around the upper half of the cornea, the lower one around the inferior half of the cornea. The superior and inferior collectors either may join to form one principal trunk or may remain separate. In the first instance, according to Orts Llorca, there is a true "peripheral lymphatic ring." Busacca considered the semicircular collectors to be only large lymphatic vessels of the plexus, concentric with the limbus. However, in numerous cases, he found a large collector which ran along the inferior fornix and was directed toward the external canthus. It was Busacca's opinion that in the upper portion of the eye, the vessels run perpendicular to the superior fornix and pass toward the orbit from there.

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Presented at the Sixty-First Annual Session of the American Academy of Ophthalmology and Otolaryngology, Oct. 14-19, 1956, Chicago.

Nataf and Delon,[12] whose report on later (1955) research has been published since the completion of this phase of our study, described two recurrent lymphatics, in addition to the lymphatics described by Orts Llorca, as (1) a superonasal recurrent collector and (2) a temporal pericorneal descending collector with a recurrent limb. The recurrent collector is smaller in size than the semiannular collectors. The superonasal recurrent trunk arises in the superior part of the nasal collector and passes to the superior cul-de-sac in the area between 10 and 11 o'clock in the left eye. It then passes toward the nasal angle and may be seen for a short distance under the caruncle. The temporal descending collector passes toward the inferior cul-de-sac and makes a hook nasally before emptying into the collector which runs along the inferior fornix. As will be seen later, we consider this to be a constant normal part of the main lymphatic ring.

Busacca undertook his study of these structures in 1936 as the result of observations of leprotic lesions of the eye treated with trypan blue dye. The method used here is that of Busacca, in which 0.1 cc. to 0.2 cc. of a 1 per cent solution of trypan blue was injected under the anesthetized conjunctiva. However, a smaller quantity, approximately 0.05 cc., was found to be more efficacious. A fine 27-gauge needle attached to a tuberculin syringe was used for the injection. Injections, which were multiple in some cases, were made in various areas of the bulbar conjunctiva of 60 human eyes.

Injection at various depths into the conjunctiva revealed that, in relation to the lymphatics, there are three zones to consider: (1) a superficial zone of fine lymphatics just under the epithelium, which is manifest, after injection of the dye, by crowded fine lines quite parallel to each other, or somewhat radiating; (2) a middle zone, slightly deeper, which shows the typical large lymphatic vessels; and (3) a deep zone in which no vessels can be seen. The middle zone is the one with which we are most concerned.

In some instances the needle penetrates into one of the lymphatic vessels and the dye shows up the channels immediately. This is particularly true in younger patients. In older individuals there may be a tendency to narrowing of the valvules, as is suggested by the tendency to lymphangiectasia in these cases. In other instances, a few minutes must pass before the channels become blue. Usually, in adults, because of the valvules, only a portion of the lymphatic collector ring is dyed with a single injection. Apparently the fluid within these vessels moves slowly and is pushed by the tissue fluid which gathers at the site of injection. Massage of the anesthetized conjunctiva containing the dye, forces the edematous fluid into the channels. In some instances we have observed marked distention of the lymphatic vessels with blue fluid, giving them the appearance of lymphangiectasia. This was found to be due to mechanical obstruction by the lid margins when the lids are held apart by the examiner. At the moment the lids were released, the distention disappeared; it could be caused to reappear with further pressure. Clinically, one may see similar localized distentions of lymphatics produced at the lower lid margins, more often in the nasal conjunctiva.

A few minutes after the dye injection, the dye begins to diffuse and some edema appears at the injected area. This gradually increases but is never significant. The stain disappears in a few hours, leaving an area of slight edema on the following day. The color tends to diffuse, but after the first few minutes it is not seen in the lymphatic vessels. Trypan blue stains only histiocytes and fibro-

cytes, and these only after large or repeated quantities of the dye have been injected.

In a few instances a small granuloma, resembling those following subconjunctival injection of atropine as described by Swan,[16] remained for several days at the site of the needle entrance.

The normal lymphatic vessels of the conjunctiva are related to those of the eyelids, which will be considered briefly. In the eyelids, three networks have been distinguished[6]: (1) subcutaneous, (2) external to the tarsal plate, and (3) subconjunctival. Communicating branches pass between them, especially the first two, and all three are united in a fine plexus at the palpebral margins. At the lateral angle of the orbit, the efferents pass obliquely across the cheek, in company with the facial vein, to end in the anterior auricular, upper parotid and submaxillary glands. Orts Llorca[13] found that the lymphatic trunks entered the anterior supra-aponeurotic parotid node in 30 of 37 cases, but never led directly to the submaxillary nodes. However, communication exists between the deep parotid and submaxillary nodes. At the nasal angle, the efferent vessels are probably related to those of the lacrimal sac; they pass, with the efferents from the nasal mucous membranes, to the retropharyngeal and superior deep cervical glands.

The larger vessels have walls which contain smooth muscle, are abundantly supplied with nerves, and are contractile.[4]

In the conjunctiva the superficial fine network communicates with the deeper network previously mentioned. Efferents join those from the lids at the medial and lateral canthi.

The vessels of the superficial network are small, about the same size as or smaller than the medium-sized veins of the area.

The vessels in the deeper network are about two to four times larger than the veins of the area. They are very irregular in diameter and appear to have aneurism-like outpouchings and valvelike constrictions which tend to give them a beaded appearance. They lie in the plane of the superficial conjunctival vessels or slightly behind them. Anastomoses are present everywhere; but definite collector vessels are also present.

In the upper fornix the lymphatics disappear into the orbital tissue. Kumamoto[9] has made an extensive study of these lymphatics.

No conjunctival nodes were found by Busacca or by us.

Although much has been written in regard to perivascular lymphatics, Busacca has found no evidence of their existence. We concur with this opinion. The white perivascular areas described by Fuchs as perivascular lymphatics, and the limbal pallisades described as lymphatics by Koeppe,[8] Vogt,[20] and others must be considered not as lymphatics at all but simply as condensations of perivascular connective tissue. Biomicroscopy of the conjunctiva injected with trypan blue shows other white crisscrossing bands, of varying size, separated from the epithelium by a transparent blue-stained layer of tissue. The white, denser tissue must be explained, like the perivascular white zones, as simply condensed connective tissue which does not allow infiltration by the injected fluid. Nerve fibers comprise some of the bands.

External to the limbus, the lymphatics form a polygonal meshwork extending toward the fornices and commissures.

The principal conjunctival lymphatic collectors, according to our observations, consist of the following elements (figs. 1-6):

1. A true ring, which extends about 7 or 8 mm. from the limbus nasally

FIG. 1—Passage of trypan blue into lymphatics in the superotemporal portion of the conjunctiva. The connections with secondary channels extending to the limbus are seen. A secondary superotemporal channel is filled by massage with a cotton applicator.

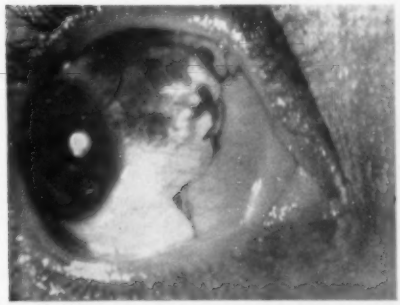

FIG. 2—The passage of trypan blue into lymphatic channels in the superonasal quadrant. The main channel extends downward nasally to the lower fornix. The secondary one passes upward and nasally to the upper fornix before going toward the caruncle.

FIG. 3—Passage of trypan blue in the main channel from the upper nasal quadrant temporally, as part of a ring.

FIG. 4—Exit of the lower main channel and the secondary temporal channel at the external commissure; the connection with the main channel in the lower fornix does not show a hooked shape as seen in figure 5.

FIG. 5—Passage of trypan blue in main channel from the temporal conjunctiva to the external commissure; the connection with the portion lying in the inferior fornix produces a hooked shape.

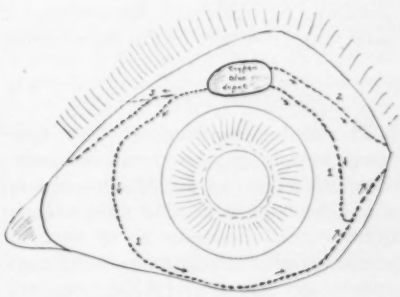

FIG. 6—Schematic drawing, showing main lymphatic channels of the conjunctiva. (1) Ring of Orts Llorca; (2) Secondary temporal vessel; (3) Secondary nasal channel.

around the cornea, runs along the lower fornix toward the temple to meet the temporal portion of the ring at the junction of the middle and outer thirds of the lower fornix, and then continues on to the lateral commissure of the eye. The temporal portion of the ring follows the limbal curve slightly nasally before joining that in the lower fornix, so that a hook-shaped junction may be produced. This is the primary collector channel. Our description differs from those of Orts Llorca and Nataf and Delon in that they consider the superotemporal lymphatic vessel as a primary channel, while we consider it as a secondary channel. The primary ring which we describe was found to be the largest channel in all cases.

2. A secondary descending temporal vessel, which lies external to the main ring in the superotemporal quadrant, passes directly to the lateral commissure, and enters the tissue there as a separate trunk.

3. A secondary nasal vessel which passes up and nasally toward the fornix, then down in the fornix to enter the area of the caruncle.

4. Small vessels passing up toward the superior fornix, presumably to enter the orbit.

A single injection in the lower nasal quadrant, in one case, demonstrated a nasal vessel directed toward the caruncle.

CLINICAL APPLICATIONS

The clinical significance of the lymphatic vessels may be considered under three headings: (1) the direction of lymphatic drainage in inflammation and malignancy; (2) disturbances of the lymphatic vessels, including (a) lymphangiectasia and (b) conjunctival lymphatic cysts; and (3) the possible relationship of the lymphatics to the effects of drugs by subconjunctival injection.

1. *The Direction of Lymphatic Drainage in Inflammation and Malignancy*

This is already well known and will not be considered further here except to suggest that occasional instances of marked conjunctival chemosis may result from pressure on the main lymphatic by a chalazion at the outer portion of the lower lid.

2. *Disturbances of the Lymphatic Vessels*

a. Lymphangiectasia

Dilated, clear, tortuous sausage-like, grossly visible lymphatic vessels frequently are seen in the exposed bulbar conjunctiva (fig. 7). They usually produce a mild irritation, such as that produced by a foreign body, for which treatment is sought. Sometimes they are associated with a hemorrhage into them or around them; in the latter case, the lymphatics may be obscured (fig. 8). Leber, Cuénod and Nataf, and Busacca[2] reported such observations. When associated with hemorrhage, they usually disappear spontaneously within a matter of a week or so. Hemorrhages into lymphatics may be observed following trauma or operation. The clear dilated lym-

FIG. 7—Lymphangiectasia. This segment is apparently part of the main collector channel as it passes temporally and downward from the nasal portion of the conjunctiva.

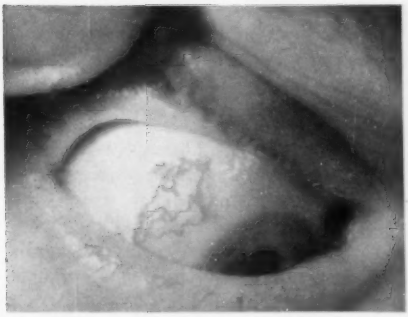

FIG. 8—Spontaneous hemorrhage into several lymph channels in the superotemporal conjunctiva. Dilated lymphatics without blood content are seen extending nasally.

phatic vessels may spontaneously disappear, but often they do not. In treating these lymphatic vessels, one should first attempt to express their contents by pressure. On the theory that lymphagogues or other edema-producers might relieve the obstruction in the lymphatic channel, we have used dionin, 1 per cent, to produce chemosis. It was effective in only one of six instances. In two other cases a small amount of trypan blue was injected into the area and was effective. However, the blue color in the exposed conjunctiva is inconvenient for the patient. We therefore returned to the expedient of simple excision of the involved area. This is done following topical anesthesia. The patient is told that a subconjunctival hemorrhage may occur but that it will be temporary; that an area of redness will be present for two weeks; and that after the first day, no covering is necessary. Some of the lymphatics around the wound area often become dilated temporarily during the time of healing.

b. Conjunctival lymphatic cysts

Spontaneous conjunctival cysts are common. Their source, either from epithelium or from telangiectasis, cannot be determined by direct observation. Microscopic study following removal serves to distinguish them. The lymphatic cysts are lined by endothelium and are movable under the conjunctival epithelium.

3. *Lymphatics and Subconjunctival Drug Injections*

Interest in the possible role of the lymphatics in the effect of subconjunctival injection of therapeutic drugs was instigated by the following observations:

T.P., 18 years of age, was first seen on July 14, 1955. For two months he had had a painless decrease in vision in his left eye. Results of a serologic test for syphilis had been positive, and he was being treated for this disease. His oldest sister similarly had been found to be suffering from syphilis. His right eye was entirely normal. The left visual acuity was reduced to finger counting at six inches. The left conjunctiva was injected, and the cornea was hazy. Some epithelial vesicles were present. The fundus could not be visualized. The ocular tension was normal. A diagnosis of syphilitic interstitial keratitis was made. Cortisone instillations were given every two hours. A subconjunctival injection of hydrocortisone was made in the upper and lower conjunctivas. There was marked improvement, and eleven days later there was marked clearing of the superior and inferior thirds of the cornea, leaving an oval central area of haziness extending laterally and medially to the limbus. The eye improved continuously. There was no evidence of inflammation in August, and the cornea continued to clear until the vision returned to normal in November.

It was felt that the rapid clearing of the cornea in the area about the subconjunctival cortisone injections might be related to the transport of the substance not only by way of the arteries to the limbus but also by way of the lymphatics by their connection with tissue spaces in the cornea. The slow lymph stream, which may be moved in either direction in the smaller vessels, could account for the effect observed. Perhaps this is also important in carrying topically applied drugs from the conjunctival sac into the anterior chamber. The importance of the lymphatics in the case cited was also suggested by the evidence

of marked lymphatic dilatation on July 25, when a small amount of trypan blue was injected into the area of the upper hydrocortisone depot.

In several normal eyes, when fluorescein was injected subconjunctivally in the 12 o'clock area about 5 mm. from the limbus, the movement of fluorescein to the limbus and into the anterior chamber was observed in about twenty minutes. It was found that the fluorescein entered not through the pupil but from the corneal margin.

At the 1955 meeting of the American Academy of Ophthalmology and Otolaryngology, we were interested in the observations of Swan, Schlegel and Crisman[17] in comparing the effect on the pupil of injecting epinephrine subconjunctivally with the effect produced when it was injected under Tenon's capsule. Because the pupil on the side of the injection under Tenon's capsule was affected first, Swan concluded that this type of therapeutic injection was more efficacious than subconjunctival injection. He believed that drugs were carried away through the veins when injected subconjunctivally. We believed that epinephrine would affect the ciliary body and iris first, after being injected under Tenon's capsule, simply because minute quantities can be absorbed into the penetrating ciliary vessels and thus affect the nerves to the ciliary and iris muscles; however, we felt that this would not be an indication of how other drugs would act. We therefore did a series of injection experiments in ten patients. Fluorescein, 2 per cent in 0.2 milliliter quantities, was injected subconjunctivally in one eye and under Tenon's capsule in the other eye, at equal distances 5 mm. from the limbus, in the superior temporal quadrant of each eye. The patient was observed biomicroscopically to determine the earliest green tinge in the aqueous beam. Fluorescein entered the anterior chamber more quickly in the eye in which fluorescein had been injected subconjunctivally (table I).

We should like to suggest that the small lymphatic channels, with their slow-moving contents, may act as storage places for instilled drugs, which may then enter the arterioles and take part in the flow toward the cornea. In addition, retrograde flow in the lymphatics may be significant.

CONCLUSIONS

Although the lymphatics of the conjunctiva have received comparatively little attention, they are an important anatomic component of its vascular system.

The existence of a ring of large collector channels in the conjunctiva is corroborated, and the variations of drainage are presented.

Lymphangiectasia appears to be the result of obstruction to flow and is best treated by excision of the involved superficial conjunctiva. Healing takes place in approximately two weeks.

It is suggested that the conjunctival lymphatics may play an important part in the transfer of subconjunctivally-injected substances into the anterior chamber. Fluorescein enters the anterior chamber more rapidly when injected subconjunctivally than when injected subcapsularly.

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TABLE I

TIME INTERVAL BETWEEN SUBCONJUNCTIVAL OR SUBCAPSULARY INJECTIONS OF FLUORESCEIN AND THE APPEARANCE OF FLUORESCEIN IN ANTERIOR CHAMBER

PATIENT	AGE	TIME INTERVAL (MINUTES)	
		AFTER SUBCONJUNCTIVAL INJECTION	AFTER SUBCAPSULAR INJECTION
1	54	18	23
2	36	17	26
3	19	21	28
4	22	17	24
5	29	22	26
6	64	18	26
7	62	19	24
8	47	19	27
9	28	22	30
10	42	20	25
Average		19.5	25.9

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DISCUSSION

KENNETH C. SWAN, M.D., Portland, Oregon: Dr. Sugar and his colleagues have performed a service for us by pointing out that the anatomy of the conjunctival lymphatic system has received little attention in the English-speaking countries. We are indebted to them not only for reviewing the European literature, but for presenting their own beautiful injection studies.

Since about 1950, my colleagues and I, notably Dr. Schlegel, Dr. Crisman and Dr. Bailey, have studied the penetration of various agents

into the anterior segment from various levels and sites in the bulbar conjunctiva. We have found that generally, but not always, there is a significant difference, depending upon the depth of the injection.

I am pleased to find that another group of investigators has found that there is a difference between subepithelial injection, that is, just under the epithelium, and subcapsular injection, which is under the capsule. This is the classification which we introduced last year.

The fact that Dr. Sugar has made some different interpretations does not mean that our data are in conflict. Rather it emphasizes two points. First, it seems probable that the route of penetration of drugs into the iris and ciliary body from these regions differs from that into the cornea, and through the cornea into the aqueous. Secondly, it emphasizes that differences in technique are important. Of importance, also are the criteria for evaluation of results.

Dr. Sugar and his group have used a different volume of injection, a different technique of injection, a different test agent, and different criteria.

Now, what are some of these other factors in addition to the depth? We have found several. Perhaps most important is the site of the injection. For penetration into the cornea, the key region is the subepithelial tissue of the limbus. If an equal volume of the test agent is brought into contact with the subepithelial reticular tissue at the limbus—the same area of the limbus—we have not found a consistent difference in penetration into the cornea of the test agents which we have used to date. In other words, as far as the cornea is concerned, our studies to date indicate that it does not make any difference whether the injection is made subepithelially or subcapsularly as long as we get an adequate concentration into the limbal area.

(Slide) Here is illustrated the eye of a 7-year-old child under general anesthesia. To the left, the injection is made under the capsule at the upper limbus. To the right, it is made under the epithelium at the lower limbus. Notice that the needle is visible here. This limbic area is the key region as far as the corneal penetration is concerned.

Our experiments indicate that if a large volume of the drug is injected way back toward the fornix, it has relatively little effectiveness as far as penetration into the anterior tissues is concerned.

(Slide) The next slide is the same child's eye after the needles have been withdrawn. Notice how much brighter the fluorescein appears when it is just under the epithelium. If you were to make an incision through Tenon's capsule and the conjunctiva in this region, and if you were to turn these layers down as a single flap, you would find the drug solution confined largely to that flap. The anterior sclera and limbic stroma would not be stained for some time after the injection. On the other hand, if you were to turn down the flap here on the side of the subcapsular injection, you would find that the anterior sclera and the stroma of the limbus were discolored.

The fact that the subcapsular injections bring the drug solution into contact with the anterior sclera and limbus stroma, we believe, accounts for the generally greater effectiveness of anterior subcapsular injection when an effect on the iris is desired, such as anesthesia for an operation for glaucoma.

The physical properties of the vehicle and the drug also enter into the picture, so more work needs to be done. If we are to do more work, what criteria are we to use? Studies with dyes are of value, but the mere time of appearance in the aqueous does not reflect the concentrations of the test substances in the iris and ciliary body. We must use quantitative methods, such as pharmacological reactions, radioactive tracers, or quantitative tissue analyses.

In our studies of penetration of procaine into the eye of the rabbit, we often found an appreciable concentration in the iris when there was little or none in the aqueous. That is understandable because the aqueous is not a stagnant pool. Evidence indicates that there is a direct route into the iris from the anterior segment with these anterior subcapsular injections. (Slide) This is one of our studies of penetration into the rabbit's eye. Notice the differences in concentrations in the iris, the aqueous, and the cornea.

Dr. Sugar did not have the opportunity to point out that he felt that one of the differences in our findings of more rapid action on the iris with subcapsular injections is that there are perforating vessels in this area which might serve as portals of entry. More work will be required, and this certainly needs consideration, but the present evidence is that the vascular system tends to carry away the major bulk of the drug from the anterior segment.

The studies made by Sorsby and his group with the sulfonamides and our studies with procaine indicate that when epinephrine is added (slide), the effectiveness of the penetration into the iris and in the cornea is notably increased. Epinephrine, of course, slows absorption into the general circulation.

I feel that this is a clinically important subject, now that we are using more and more agents by injection, and I hope that other groups will become interested, too.

KARL W. ASCHER, M.D., Cincinnati: I am grateful indeed for the privilege of discussing this paper, which fills a gap in the American literature. It is beautifully illustrated and boasts the first motion picture of conjunctival lymphatics ever presented.

In other countries, the lymphatics of the conjunctiva have been studied by quite varied methods, ranging from injection of metallic mercury to instillation of hydrogen peroxide, and even to observation of the uninfluenced conjunctiva. The various descriptions of the circulus lymphaticus conjunctivae and its nasal and temporal efferents have not differed much throughout the past hundred years. Sugar and his associates succeeded in establishing exactly the distribution of the main trunks and the direction of flow in them.

My discussion may not provide answers to the questions yet open, but I shall elaborate on some of the methodologic, physiologic, and clinical aspects, and thus possibly encourage further research.

Since Sugar's study was instigated by the clinical aspects of lymphangiectasia, let us consider these first. One will rarely encounter serious diagnostic and therapeutic problems in dealing with lymphangiectasias. By their characteristic shape, they will be easily differentiated from other cystlike features in the bulbar conjunctiva and episclera. Whether or not such a lesion should be removed depends on the attitude of the patient and of the physician. The patient may be frightened by what he calls a "glassy mass" or "sticky mucus" in his eye, detected by himself or someone else. If I find a lymphangiectasia which the patient has not noticed, I record it, without mentioning this to the patient. Larger lymphangiectasias may cause discomfort, mainly when the eye moves. If this discomfort is marked, removal of the lesion may be considered. In many cases, however, reassurance is the proper approach. In very apprehensive persons, cosmetic considerations may enter the picture. Massage usually does not suffice, and therefore it should not be repeated uselessly. The diathermy needle will, under local anesthesia, easily obliterate the distended lymph vessels, with little aftercare needed. In larger lymphangiectasias, excision may eventually be indicated.

Considering the anatomical facts reported by Dr. Sugar and his associates, I find them in agreement with classical descriptions of the conjunctival lymphatics established by different methods previously, and there is no question that the illustrations presented here are much more accurate and convincing than those published in older articles.

Long ago, the question arose whether the pathways evidenced by injections of many different substances into the conjunctiva were pre-existent or artefacts, since the injected substances might have been forced into cleavage spaces of lowest tissue resistance, not into anatomically preformed channels.

Wherein lies the proof that these features are true lymphatics? Ninety years ago, Theodor Leber was able to move material injected into these conjunctival channels, shifting it back and forth along these structures, and this he considered as proof that he dealt with preformed channels, most probably lymphatics, and not with artefacts. Comparing his results with those of von Recklinghausen, Leber stated that final proof should be the demonstration of an endothelial lining in these vessels. Observations of spontaneous filling of vessels, presumably lymphatic, were supposed to be more convincing. Theodor Leber, in 1880, described the spread of hemorrhages of the bulbar conjunctiva producing string-of-beads-like extensions into the clear conjunctiva; he considered these extensions to be casts of the conjunctival lymphatics. Later, Elschnig, Handman, Knüsel, and others confirmed these observations. Knüsel considered the rapid bloodfilling of lymphatic channels, as compared to the slow spread of blood in the conjunctiva proper, as a proof of its proceeding in preformed pathways.

To obviate the objection of possible artefacts, since the advent of slit lamp microscopy, attempts have been made to demonstrate conjunctival lymphatics without forcibly introducing foreign material. In 1922, Knüsel identified water-clear tracks in the human conjunctiva as conjunctival lymphatics and confirmed this observation by instillation—not injection—of 5 per cent brilliant cresyl blue into the conjunctival sac. The structures stained by this method showed a distribution similar to that described by previous investigators, but there were no constrictions or dilatations, and the vessel walls were almost parallel to each other.

These observations corroborated older studies performed by means of injection and showed that the previously described structures most probably were not artefacts. However, histologic proof by demonstration of endothelial linings of the conjunctival lymphatics was lacking. The physiologically important question as to the presence of Rouget cells in

conjunctival lymphatics is still open, while such cells have been assumed to exist in mesenterial lymphatics (Webb).

Here I should recant a statement I made in 1924, identifying biomicroscopically the limbal ridges (Leisten) of Manz as conjunctival lymphatics. I may be pardoned for this error, which I shared with such astute observers as Koeppe, Vogt, Meesmann, Gallemaerts and Knüsel; even Duke-Elder in his Text-book (vol. 1, fig. 58, p. 47) reproduced an illustration from Knüsel's paper representing this misinterpretation. Our error was refuted in 1928 by Winkler Prins, and in 1939 by Busacca.

I have found in the literature no demonstration of true conjunctival lymphatics with typical endothelial lining; I should therefore like to present a photomicrograph illustrating a large lymphangiectasia and, adjacent to it, an elliptic lumen lined by endothelium and apparently merging into the lymphangiectasia (fig. D-1). I think that this is a cross-section through a true conjunctival lymphatic vessel from which a lymphangiectasia derives. I would not dare to say whether the projections on either side correspond to a distended valvule.

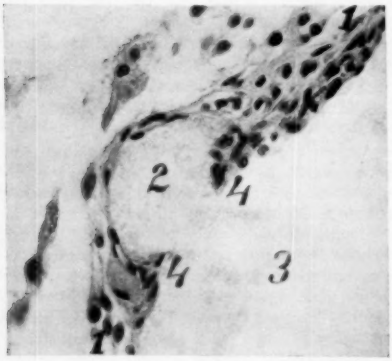

FIG. D-1.—From left temporal bulbar conjunctiva of female patient, 57 years old, a lymphangiectasia was removed in March, 1950. Five years previously, a lymphangiectasia was removed from a corresponding site on the right bulbar conjunctiva. Microphotograph shows high-power magnification of cross-section through (1) wall of lymphangiectasia and (2) lymphatic vessel merging into ectatic area (3). Note wedge-shaped projections (4) at site of entrance.

I feel that some reference to the aqueous veins is expected of me. From the descriptions and illustrations in the paper under discussion, as well as from those of previous investigators throughout the decades, there is no indication of a relation between the conjunctival lymphatics and the aqueous humor drainage system. My illustration shows a lymphangiectasia located superficially above, and without any connection to the underlying aqueous vein.

The fact that "fluorescein, injected subconjunctivally 5 mm. above the limbus, moved towards the limbus and twenty minutes later appeared in the anterior chamber" does not prove the presence of microscopically demonstrable pathways. Histologically, connections between conjunctival lymphatics and the anterior chamber have not been found. We do know, however, that substances can be transported through submicroscopic passages. Even large molecules may penetrate the blood-aqueous barrier in considerable amounts in either direction. This transport is a slow one, while with gross connections between subconjunctival lymphatics and the drainage system made up of the canal of Schlemm and the aqueous veins, one would expect rapid entrance of the dye into the anterior chamber, although this would be a transport opposite to the normal direction of aqueous flow.

Another point worthy of discussion is the presence and function of valves or valvules in these lymphatics. As is true of those in other sections of the lymphatic system, valvules in the conjunctival lymphatics have been described throughout the decades by various investigators, but until this presentation by Sugar and his associates, no one seems to have discussed their significance in the relative difficulty of injecting conjunctival lymphatics in older individuals and in the formation of lymphangiectasias. These are interesting new suggestions, and deserve further study.

Normally, the presence of valvules in the conjunctival lymphatics should be considered as a means for the maintenance of unidirectional flow. The observations of Sugar and associates point toward a preferred direction of lymphatic flow from the nasal to the temporal side, with an occasional reversal in the lower portion of the lymphatic ring. If valves exist and function in these conjunctival lymphatics, one should expect them to counteract retrograde flow and, therefore, to counteract transport of drugs from the conjunctiva toward or into the cornea, or even into the anterior chamber. If substances injected subconjunctivally enter the cornea, it does not seem likely that lymphatics carried them toward—and still less likely, beyond—the lim-

bus. Their function most probably is, as elsewhere in the organism, removal of waste products, not transport toward the organs,

In these deliberations, of course, no denial of the clinical importance of the conjunctival lymphatics is intended.

The comparison of the presented study with observations by Swan, Schlegel and Crisman concerning the penetration of drugs injected superficially or beneath the conjunctiva is stimulating, since numerous anatomic, physiologic and physicochemical factors are involved. At this present stage of the investigation it seems rather difficult to decide whether diffusion plays the main role, whether tissue spaces or tissue barriers enhance or deter desired drug actions, or whether preformed channels contribute. Certainly these problems are provoking and deserve further attention.

DR. SUGAR: I should like to thank the discussers and to tell them that I feel honored to have such distinguished men discuss this material.

To me, there is one thing in particular about the importance of the lymphatics. They suggest ways in which we can interpret the entrance of drugs—like homatropine, for example—into the anterior chamber. We studied four cases in which the rubber cap of an eye dropper was filled with 4 per cent homatropine and applied to the bulbar conjunctiva 4 mm. inferotemporal to the limbus for thirty seconds. The conjunctival sac was then well irrigated, away from the cornea, with saline solution. The time elapsed before the pupil dilated 1 mm. more than that of the other eye was found to be 28, 34, 36, and 36 minutes, respectively. We felt that the drug entered the anterior chamber through the arterioles to the limbus or that the lymphatics might have acted as a depot from which the drug entered the arterioles.

FIT-OVER FRAME

FRANK D. COSTENBADER, M.D
WASHINGTON, D. C.

OFTEN, the need arises for using correcting lens, Maddox rod, etc., while the patient is wearing his own glasses. With this in mind, the "fit-over cell" has been devised (fig. 1).

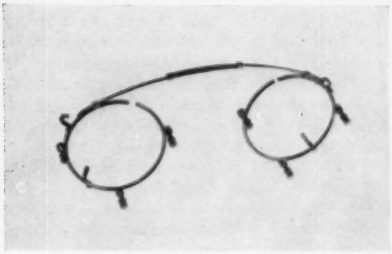

FIGURE 1.

This small instrument is similar to the clip-on or fit-over dark glasses used for protection from excessive sunlight. It consists of a frame having an adjustable spring bridge with variable pupillary distance and fitted with knurled pegs, so placed that two additional lenses may be fitted before each eye.* This frame easily clips to the patient's glasses.

I have found the "fit-over cell" most helpful in several ways in the examination of children, and others have found it equally helpful in dealing with adults.

1. When a manifest or cycloplegic refraction is being done a second time, it is often easier to work directly from the patient's own glasses. Additional plus or minus spheres and cylinders may be inserted in the "fit-over cell," thus changing the patient's total correction.

2. Muscle balance may be tested with the patient's own glasses in use, by mounting a Maddox rod in the "fit-over cell" (fig. 2).

FIGURE 2.

3. The fit-over cell is extremely valuable when one is determining the minimal hyperopic correction needed to maintain good vision and bifoveal fixation in patients with accommodative esotropia.

4. The blank, the pinhole, the ruby lens, the Maddox double prism, and all of the other auxiliary lenses in the trial case may be easily superimposed upon the patient's own glasses by use of the "fit-over cell."

There is one special advantage in the "fit-over cell" when one is examining small children. Most trial frames do not place lenses as accurately before the eyes as do the child's own glasses. Thus, if the "fit-over cell" is used on the child's glasses, the lenses are most accurately centered.

*Manufactured by Parsons Optical Laboratories, Inc., 520 Powell St., San Francisco, Calif.

Presented as a *New Instrument* at the Sixty-First Annual Session of the American Academy of Ophthalmology and Otolaryngology, Oct. 14-19, 1956, Chicago.

THE IMPROVED ACCOMMODOMETER

FRANK D. COSTENBADER, M.D.
WASHINGTON, D. C.

SEVERAL years ago an accommodometer was presented as a new instrument at the Academy meeting, but it was never made commercially available. Since that time certain simplification and reinforcement in construction have taken place.

The Accommodometer,* which is a paddle-shaped instrument about 12 inches long, contains a rotary disc. On one side of this disc appears symbols (letters and illiterate *E*'s), graduated from 20/400 to 20/20 (the visual angles being comparable to the Snellen chart). These symbols are presented singly to the patient through a small aperture. On the patient's side of the instrument is a tape, scored on one side in millimeters, and marked on the other side according to Prince's accommodation scale (fig. 1). The other side of the rotary disc (the examiner's side) contains symbols which correspond in character to those on the patient's side but which are uniformly large (to favor the presbyopic examiner). These symbols are viewed through an aperture which shows three symbols at one time.

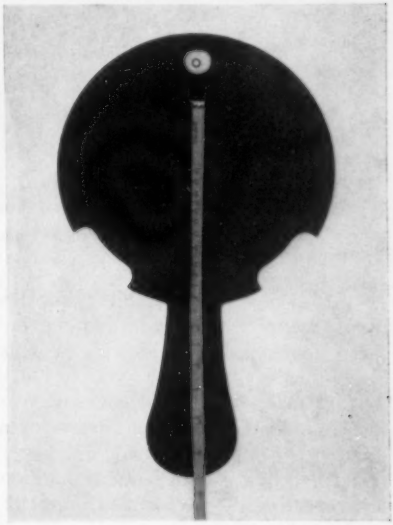

FIG. 1—The side turned toward the patient exhibits single symbols, graduated from 20/400 to 20/20, and has a scored tape for measuring distance and accommodative ability in diopters.

The Accommodometer has three primary uses:

1. The *near point of accommodation* may be accurately tested by holding the tape at the lower orbital rim of the patient's eye and gradually moving the instrument *away from the eye* until the patient can just identify a 20/30 symbol. A more exact end-point may be obtained for both children and adults than that obtained by the customary *approach* method of examination. While each eye is being tested, the other should be carefully covered (fig. 2).

2. *Visual acuity at 13 inches* may be accurately estimated by placing the 33 cm. mark on the tape against the orbital rim. Starting with a 20/400 symbol, present symbols progressively smaller until the smallest that the patient can visualize has been reached.

3. The *weakest hyperopic correction* essential for good vision and straight eyes *in accommodative esotropia* may be easily determined, as recently described.[1]

*Manufactured by Parsons Optical Laboratories, Inc., 520 Powell St., San Francisco, Calif.

Presented as a *New Instrument* at the Annual Session of the American Academy of Ophthalmology and Otolaryngology, Oct. 14-19, 1956, Chicago.

FIG. 2—The Accommodometer in use while testing the "near point of accommodation."

In this procedure, the full cycloplegic correction is placed in a trial frame, and the patient is asked to identify progressively smaller symbols from 20/400 to 20/20, during which time cover-uncover is being done to be sure that bifoveal fixation is being maintained. The hyperopic correction is then reduced 0.5 diopter, repeating the performance until the weakest hyperopic correction allowing bifoveal fixation and clear vision has been arrived at. This should be determined at 20 feet (preferably with a projector, e.g., the Projecto-chart), and at 13 inches with the Accommodometer. Determining the smallest necessary hyperopic correction in accommodative esotropia is an important step in the attempted elimination of spectacles. This is also an indirect method of determining the relative fusional divergence.

The Accommodometer offers certain advantages over existing instruments for performing the above tests:

1. The instrument is easily used with one hand, leaving the other free.
2. The instrument may be held with either the right hand or the left.
3. The examiner may view symbols identical with those being viewed by the patient.
4. Only one symbol is exposed to the patient's view at any one time, and symbols may be instantaneously changed. This is particularly helpful in the examination of children who tend to memorize the test symbols presented, thus failing to give a clear-cut end-point.
5. Finally, the Accommodometer is of very sturdy construction and should last indefinitely.

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A NEW FIXATION FORCEPS

J. W. BETTMAN, M.D.
SAN FRANCISCO, CALIFORNIA

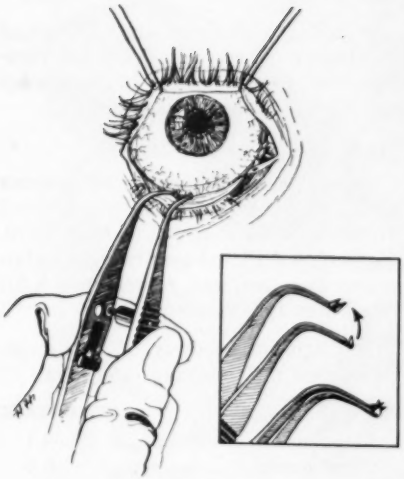

FIG. 1—A new fixation forceps, showing teeth protruding toward rectus muscle.

FIG. 2—A new fixation forceps.

THESE curved, locked, fixation forceps are designed to grasp securely the insertion of the rectus muscle for fixation during a cataract extraction, a goniotomy, or some other intraocular procedure. The principal innovation is that the secure mouth teeth protrude forward toward the rectus insertion while the forceps handle is lying on the cheek or forehead with the assistant's hand away from the eye (fig. 1). The forceps are a modification of the Noyes forceps, and are made by the Storz Instrument Company.

Some of the other forceps designed for this purpose have multiple interlocking teeth, which tend to tear tissue. Others have teeth that do not protrude toward the rectus muscle while the forceps are in their usual position; this makes fixation insecure.

The new forceps make for secure, atraumatic fixation (fig. 2).

Presented as a *New Instrument* at the Annual Session of the American Academy of Ophthalmology and Otolaryngology, Oct. 14-19, 1956, Chicago.

A NEW INSTRUMENT AND CONCEPT FOR THE RAPID DETECTION OF A POSSIBLE HEARING IMPAIRMENT

HOWARD P. HOUSE, M.D.
LOS ANGELES, CALIFORNIA

THE INSTRUMENT

THE Oto-Chek is a compact, battery-powered, transistorized, screening audiometer. There are two basic models of the Oto-Chek. One is a single-frequency model designed to test hearing at 4000 cycles, with fixed output levels of 20, 35 and 50 decibels (fig. 1). The other is a double-frequency model designed to test hearing at 2000 cycles and at 4000 cycles with fixed output levels of 15 and 35 decibels (identifying tone) (fig. 2). Either model is available with single or double earphones. When binaural earphones are used, the live earphone is selected by rotating a two-position switch. The earphone is energized by push buttons, which are labeled in decibels of hearing loss according to the output level.

The Oto-Chek is housed in a metal box, measuring 5.5 by 4 by 2 inches, and weighs approximately one and one-half pounds. Power is supplied by a Mallory mercury cell-type battery and energizes a dynamic-type earphone.

CONCEPT OF SCREENING METHOD

This concept of auditory screening resulted from the observation that very few audiograms show a greater loss in the lower frequencies than is shown at the 4000 cycle frequency.

VALIDATION OF THIS CONCEPT

To validate this observation, three large sample groups of audiograms were analyzed at 4000 cycles, and 1500 school children in the Los Angeles School System were tested with the two-frequency Oto-Chek (2000 and 4000 cycles).

Audiogram Sample 1

Every tenth audiogram of patients with a hearing impairment was selected from my office files dating from 1950. Eleven hundred and twenty-eight audiograms were analyzed, representing a total of over 11,000 cases.

A diagnostic analysis of this series established the following categories:

	PERCENTAGE
Otosclerosis	34.1
Presbycusis	16.6
Miscellaneous	49.3

An analysis of these audiograms revealed that 98.2 per cent of the cases that showed a 15-decibel loss at 4000 cycles in either ear had no greater loss at any lower frequency. When the 2000-cycle frequency was added, the accuracy was increased to 99.2 per cent. Therefore, if one tests at 4000 cycles with an output of 15 decibels, only 1.2 per cent of the patients so tested will have a greater loss in any of the lower frequencies. If the 2000-cycle frequency is added, this figure is reduced to 0.8 per cent.

Audiogram Sample 2

A study of the records of 1971 male aircraft workers, taken from the files of the Subcommittee on Noise in Industry, revealed that 99.2 per cent of these workers had no greater loss at any lower frequency than was recorded at 4000 cycles.

From the Department of Otolaryngology of the University of Southern California School of Medicine.

Presented as a *New Instrument* at the Annual Session of the American Academy of Ophthalmology and Otolaryngology, Oct. 14-19, 1956, Chicago.

FIG. 1—Single frequency model for industry and military screening.

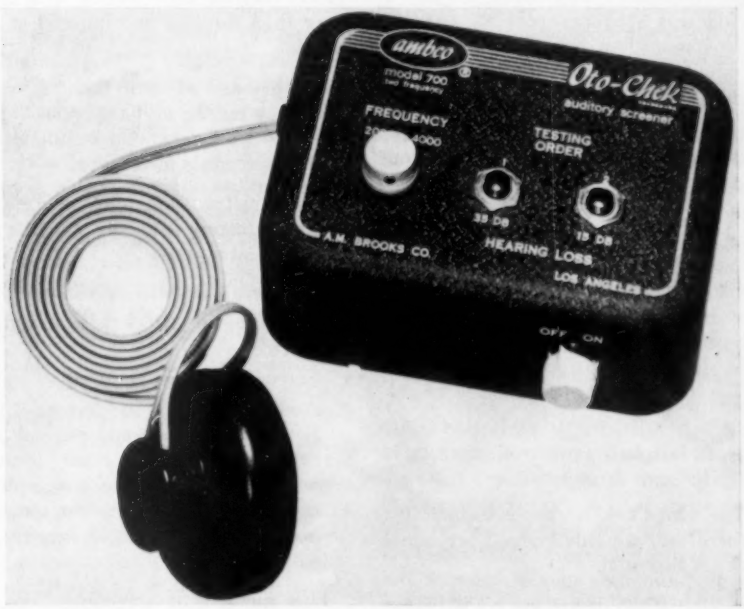

FIG. 2—Double frequency model for school programs and doctors' offices.

Audiogram Sample 3

A similar study of the records of 1749 males, taken from the 1954 Wisconsin State Fair Hearing Survey, revealed that 99.5 per cent had no greater loss at any lower frequency than was recorded at 4000 cycles.

School Test Sample

Fifteen hundred Los Angeles school children were screened by the school audiologist, using the Oto-Chek at 4000 cycles. Each child was made familiar with the 4000-cycle test tone by identifying the 4000-cycle test tone at the 35-

decibel level. This was then followed by the test tone at the 15-decibel level.

This Oto-Chek test was then followed by the standard sweep-check method used in the Los Angeles School System. (This method checks each frequency at the 15-decibel level.) All failures by either the Oto-Chek or the standard sweep-check technique were then routinely tested individually by the usual threshold method.

The results revealed that 94.4 per cent passed the Oto-Check method and 93.9 per cent passed the standard sweep-check method. This indicates that the single-frequency Oto-Check screening method was 99.5 per cent as accurate as the standard sweep-check method under similar conditions with the same children.

Five hundred of these children were then screened by the Oto-Chek method at both 2000 and 4000 cycles to determine whether a greater accuracy would result when two frequencies were used. No noticeable increase in accuracy resulted. It is felt, however, that if 2000 cycles is added routinely, fewer unnecessary referrals of school children will be made, due to the insignificant "dips" at 4000 cycles which are frequently found.

ADVANTAGES OF THIS INSTRUMENT AND THIS METHOD

1. The Oto-Chek is simple to operate; therefore, a highly trained personnel is not essential.
2. Sound-treated test areas are unnecessary. Relatively quiet rooms are sufficient, since hearing for 2000 and 4000 cycle tones is not affected by the ambient noise levels found in most offices, first-aid rooms, and classrooms.
3. Only a few seconds are required to complete this test, thereby saving considerable time. The fatigue factor encountered in testing small children is eliminated.
4. The Oto-Chek is operated by battery; therefore, the location of power outlets is no problem.
5. The instrument is durable, light, compact and inexpensive.

CONCLUSIONS

These studies reveal that, for appropriate groups, one can quite accurately predict that losses at any standard frequency before 4000 cycles will not be more than the loss encountered at 4000 cycles.

On the basis of these findings, single-frequency testing at 4000 cycles will accomplish the same end result as any present screening method.

This instrument and concept of screening testing is ideally suited for the following situations:

1. Follow-up tests in industry
2. Screening inductees prior to military service
3. Screening school children
4. Auditory testing in doctors' offices (otolaryngologists and general practitioners), and in other locations where it is desirable to employ a rapid method of determining the presence of a possible hearing impairment.

This method of screening, like any other screening method, merely indicates that certain persons have failed to hear the specified frequencies at predetermined levels. Further tests by other methods are necessary to determine the true extent and type of hearing loss.

TRANSACTIONS

American Academy of Ophthalmology and Otolaryngology

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All communications regarding the TRANSACTIONS should be addressed to
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American Academy of Ophthalmology and Otolaryngology,
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LENS STANDARDS

The British Standard Institution, as a result of a "request from the Ministry of Health, by a committee representative of Ophthalmologists, of Ophthalmic and Dispensing Opticians and of the Manufacturers and Government Departments concerned," CV (M) 4978 proposed a British Standard for spectacle lens. This action predated that taken by the American Standards Association, Sectional Committee Z80, which includes representatives of Ophthalmology, Optometry, Opticianry (from the manufacturing level to the dispensing level), U. S. Bureau of Standards, U. S. Public Health Service, National Society for the Prevention of Blindness, Armed Forces, Veterans Administration, etc.

The first objective is an American standard at the manufacturer's level to be followed through to the dispensing level in due time. It is recognized that an educational program will be necessary in conjunction with this policy to ensure the end product which we desire.

The tolerance of an individual for lens defects and errors is admittedly a variable factor of considerable proportions. Our proposed standards cannot afford such latitude, and we intend to make them as high as the best of minds and machinery can produce without inflicting a prohibitive price upon the consumer. In addition to the surface and physical characteristics of the glass, we have a keen interest in setting the tolerances for (a) introduced prismatic effect: intentional or otherwise; (b) cylinder axis: the higher the power, the more exacting it will necessarily have to be; (c) power: the higher, the less exacting or greater tolerance; and (d) centration and thickness.

Corrected curve lenses to the exclusion of the toric lenses were advocated by the Association of Independent Optical Wholesalers at their 1950 meeting. If this necessitates a material increase in cost, I do not believe it to be advisable in all prescriptions, as I am quite prone to agree with a statement of Dr. James E. Lebensohn, "Corrected curve lenses are essential in plus compounds, but in simple spherical lenses, plus or minus, and in compound minus lenses, there is no essential difference between the toric and corrected curve coflexures." Single vision and multifocal lenses will necessarily conform to prescribed standards, as will types of glass, including the tint of glass, and plastics. There are several

standards at the present time, which is a source of confusion. Dr. Glen Frey, who has a seat on the Z80 Committee, was instrumental in formulating one of the best standards. Dr. F. E. Washer, representing the U. S. Bureau of Standards, found it necessary to set up his own standards in accepting ophthalmic lenses for the Veterans Administration.

The Optical Manufacturers' Association's Standards for first-quality semi-finished single vision and multifocal lenses (corrected and noncorrected forms) originally have been accepted as a guide to a national American Standard. Many suggestions from the A.S.A. Z80 Committee were taken under advisement by the Lens Technical Subcommittee of the Optical Manufacturers' Association, which is also a Z80 Subcommittee. Their recommendations will be sent to each member of the Z80 Committee some time before their next meeting (probably May 1957) for approval and constructive criticism.

CARL J. RUDOLPH, M.D.
Academy Representative,
Z80 Committee

NATIONAL SOCIETY FOR MEDICAL RESEARCH

The following letter has been received from the National Society for Medical Research:

February 20, 1957

Dear Dr. Benedict:

Probably you have read the news that the Federal Bureau of Internal Revenue has denied charitable status for contributions to the American Antivivisection Society. The National Society for Medical Research has been working with revenue authorities for a number of years to bring about this action. As a result medical science will be freer still from cultist harassment.

This is a fifth step in the general program of the NSMR.

Our first step was removing the cloak of secrecy that surrounded animal experimentation for so long. Second was eliminating the antivivisection campaigns of the Hearst Publishing Corporation. Third was assisting in the development of programs to improve the care of laboratory animals. And fourth was promoting the policy of supplying laboratory needs for dogs and cats from among the unclaimed, unwanted animals ordinarily put to death in public pounds.

I think you will agree that although we have made progress, many obstacles yet remain and much more can be done to encourage the growth and strengthen the condition of medical research.

On behalf of all of our officers and directors and staff, I want to thank you and your organization for helping to make possible these important forward steps. The anniversary of your last contribution is near. We hope that we may again have your help.

Sincerely yours,

[Signed]
LESTER R. DRAGSTEDT, M.D., PH.D.
President
[National Society for
Medical Research]

LETTER TO THE EDITOR

American Academy of
Ophthalmology and Otolaryngology
Rochester, Minn.
Gentlemen:

A few years ago my father came very close to having a car accident. Realizing he wasn't seeing well, my father went to every eye specialist in the city. Each doctor merely prescribed a different pair of glasses. By the time my father went to see Dr.——, the only doctor who rec-

ognized his condition as glaucoma, one eye was completely sightless and the other almost as hopeless.

Magazine articles that call peoples' attention to the need for having eyes examined for glaucoma are helpful for only those who read that article.

I therefore suggest that you do what you can to insist that every eye specialist examine eyes for possible glaucoma when people come to them to have their eyes checked for glasses.

Yours truly,

P.S.—It would be only fair to mention that two doctors were out of town dur- that time.

In Memoriam

Abram Brekeman Bruner.....Cleveland, Ohio
January 9, 1957

Gail Ellsworth Chandler.....Miami, Florida
December 15, 1956

J. D. Collins.....Northampton, Massachusetts
January 12, 1957

Robert Carson Fraser.....Los Angeles, California
December 13, 1956

William H. Stokes.....Lake City, Michigan
April 8, 1957

James W. Ward.....Greenville, Texas
December 16, 1956

Joseph R. Weintrob.....Atlantic City, New Jersey
January 28, 1957

Minor Elisha White.....Kankakee, Illinois
December 26, 1956

THE INTERNATIONAL ASSOCIATION OF SECRETARIES OF OPHTHALMOLOGICAL AND OTOLARYNGOLOGICAL SOCIETIES

AN UNCOUNTED REWARD

As our world shrinks, from the standpoint of time and travel, the importance of international understanding and goodwill increases. An acquaintance begun through a natural interest in medicine can become a significant avenue for future friendship and widened understanding.

The membership of this International Association of Secretaries has as its aim the improvement of individual ophthalmologists and otolaryngologists, the betterment of programs for local and regional societies, accumulation of information for the American Academy of Ophthalmology and Otolaryngology, and dissemination of knowledge and literature throughout the Free World.

A new acquaintance here, a new encounter there, will strengthen our service to these objectives and will unite all of us in this common bond as servants of medicine. This is an extra profit to the members of our Association, to their respective societies, and to the medical profession as a whole; it is an uncounted reward.

In the immediate future our Association will play a special part in the promotion of goodwill and friendship at the International Congress of Otolaryngology in Washington. Our members will be on hand for advice and entertainment and will maintain a hospitality lounge throughout the Congress to which physicians from all over the world will be welcome.

LEWIS E. MORRISON, M.D.
Active Director

MEETINGS

CANADIAN OPHTHALMOLOGICAL SOCIETY

1957 Meeting: Banff, Alberta; June 13-15

1958 Meeting: Halifax, Nova Scotia; June 11-13

1959 Meeting: Niagara Falls, Ontario; September

AUSTRIAN OPHTHALMOLOGICAL SOCIETY

Annual Convention: Innsbruck, May 31-June 1, 1957.

FRENCH OPHTHALMOLOGICAL SOCIETY

May 12-16, 1957; Maison de la Chimie, 28 bis rue Saint-Dominique, Paris.

On the program are Drs. Busacca, Goldmann, and Schiff-Wertheimer. Dr. Schiff-Wertheimer will discuss "Biomicroscopy of the Vitreous Body and the Ocular Fundus."

BELGIAN OPHTHALMOLOGICAL SOCIETY

June 30, 1957; Boulevard de Waterloo, no. 54, Brussels.

November 24, 1957; Boulevard de Waterloo, no. 54, Brussels.

SECTION ON INSTRUCTION

SIXTY-SECOND ANNUAL MEETING

American Academy of Ophthalmology and Otolaryngology

October 13-18, 1957

PALMER HOUSE

Chicago, Illinois

A. D. RUEDEMANN, M.D.
Secretary for Instruction — Ophthalmology

DEAN M. LIERLE, M.D.
Secretary for Instruction — Otolaryngology and Maxillofacial Surgery

This Section presents for 1957:

Ophthalmology: 160 Individual Courses; 50 Continuous Courses. The faculty is comprised of 256 instructors, and the hours of instruction total 405.

Otolaryngology: 110 Individual Courses; 27 Continuous Courses and Panel Discussions. The faculty is comprised of 142 instructors and the total number of instruction hours is 222.

General Instructions

Only members who have paid their 1957 *dues may order instruction tickets in advance of the meeting.* Members should order tickets only for their own use. Candidates for fellowship in the Academy are not privileged to reserve tickets in advance. After the session opens, no distinction between members, candidates and guests will be made in selling tickets.

Each period (1 hour) of instruction costs $2.00. *Orders unaccompanied by properly executed checks will not be filled.* Checks should be made payable to W. L. Benedict, M.D.

In case of inability to attend the meeting after order has been filled, a refund will be granted if requested prior to October 11.

If courses requested are not available and it is impossible to substitute, a refund will be granted. Refunds will not be sent by mail. A blue refund card will be placed in the Advance Registration Envelope which is received at the time of registration. This should be presented at the Instruction Desk for payment.

All orders for tickets will be filled according to postmark on envelope containing check. Telegrams will not be honored. Orders will not be accepted for presale after October 3. To ensure acceptance they should be mailed by September 30 to William L. Benedict, M.D., 15 Second Street S.W., Rochester, Minnesota.

Ordering Instruction Tickets

An *individual* course is complete in one (1) period. Most individual courses are repeated on two different days, allowing the subscriber to choose the day on which he wishes to attend.

A *continuous* course runs two (2) or more periods as indicated. It is not possible to purchase a ticket to only *part* of a continuous course.

At the end of this section is printed a colored sheet to be used when ordering tickets in advance. Specify preferences on this sheet and mail to the executive office. Careful attention to instructions will ensure the correct filling of your requests. *Since number of tickets for each course is limited, be sure to list second and third choices for each period in case first choice is already sold out. In every case, effort will be made to furnish first choices.*

If you are requesting registration in the continuous courses, please specify preferences for individual courses as substitutes in order to avoid disappointment should the continuous courses which you select be sold out when your order is received.

Acknowledgment of Advance Order

As soon as an advance order is filled, a postcard, listing the courses that have been reserved for him, will be mailed to the subscriber. Please do not ask to change courses after your order has been filled. The postcard is merely an assurance that your order has been filled; it is not necessary for registration at the Academy meeting.

Claiming Instruction Tickets

No tickets will be sent through the mails. Members who have ordered instruction course tickets will register at the *Advance Order Section* of the Registration Desk during the week of the Convention to secure registration badge, tickets, and all convention material.

Tickets will be on sale during the meeting at the Instruction Desk in the Registration Foyer.

KEY TO DESIGNATION OF PERIODS

The periods will be designated with the following key: Select tickets for — Otolaryngology, forenoons, periods 1-2-3 — Ophthalmology, afternoons, periods 4-5-6

Day	(M)onday	(T)uesday	(W)ednesday	(Th)ursday
Period a.m.		1 2 3	1 2 3	1 2 3
Period p.m.	4 5 6	4 5 6	4 5 6	4 5 6

M-4	2:00 p.m. to 3:00 p.m.	W-4	2:00 p.m. to 3:00 p.m.
M-5	3:15 p.m. to 4:15 p.m.	W-5	3:15 p.m. to 4:15 p.m.
M-6	4:30 p.m. to 5:30 p.m.	W-6	4:30 p.m. to 5:30 p.m.
T-1	9:00 a.m. to 10:00 a.m.	Th-1	9:00 a.m. to 10:00 a.m.
T-2	10:15 a.m. to 11:15 a.m.	Th-2	10:15 a.m. to 11:15 a.m.
T-3	11:30 a.m. to 12:30 p.m.	Th-3	11:30 a.m. to 12:30 p.m.
T-4	2:00 p.m. to 3:00 p.m.	Th-4	2:00 p.m. to 3:00 p.m.
T-5	3:15 p.m. to 4:15 p.m.	Th-5	3:15 p.m. to 4:15 p.m.
T-6	4:30 p.m. to 5:30 p.m.	Th-6	4:30 p.m. to 5:30 p.m.
W-1	9:00 a.m. to 10:00 a.m.		
W-2	10:15 a.m. to 11:15 a.m.		
W-3	11:30 a.m. to 12:30 p.m.		

(Familiarity with this key will be helpful and will avoid confusion)

1957

CONTINUOUS COURSES — OPHTHALMOLOGY

COURSE 1

Room 731 Periods M-4, T-4, W-4

FRANCIS ADLER, M.D.
Philadelphia

Physiology of Vision

A three-period course—$6.00

This is an elementary course designed to cover our present knowledge of the transformation of light energy into the message sent to the brain. The material is divided into three parts. In part one, the energy spectrum is described and that portion capable of initiating vision in human beings and phototropic responses in animals is analyzed in terms of wave mechanics and energy content.

Part two deals with the transmission of light energy through the ocular media and its selective absorption by visual pigments. The known facts about the visual pigments of the human eye are detailed and the cycle of their breakdown by light and resynthesis in the retina is described, following the recent work of Wald and his co-workers.

Part three deals with the transformation of the energy released from the visual pigments by light into changes in the electrical potential as recorded by electroretinography. The further activation of the optic nerve fibers is then described, and the character of the message the optic nerve relays to the brain is detailed for various types of stimuli, in other words, how the retina signals changes in light intensity, colors, and dark adaptation.

The course is designed to meet the need for basic knowledge in visual physiology and will serve as an introduction to recent developments in electroretinography. It is not recommended, therefore, for those who wish practical applications.

COURSE 2

Room 738 Periods M-4, M-5, T-4, T-5, W-4, W-5, Th-4, Th-5

JAMES H. ALLEN, M.D., et al.

Bacteriology and Infectious Diseases of the Eye

An eight-period course—$16.00

The first hour of the course will be devoted to bacteriology and methods of etiologic diagnosis of infectious diseases. Six hours will be devoted to the clinical manifestations and differential diagnosis of infectious and allergic diseases of the eye, and one hour will be devoted to a general summary of the therapy of infectious diseases.

M-4—Bacteriology
James H. Allen, M.D.
New Orleans

M-5—Infections of the Lids and Lacrimal Apparatus
Hugh Ormsby, M.D.
Toronto, Ont., Canada
BY INVITATION

T-4—Bacterial Infections of the Conjunctiva
Isadore Givner, M.D.
New York

T-5—Allergic Diseases of the Lids, Conjunctiva, and Cornea
Frederick H. Theodore, M.D.
New York

W-4—Infectious Diseases of the Cornea
Henry F. Allen, M.D.
Boston

W-5—Virus Infections of the Lids and Conjunctiva
Samuel J. Kimura, M.D.
Berkeley, Calif.

Th-4—Infections of the Orbit and Globe (to include surgical infections)
Gustav Bahn, M.D.
New Orleans

Th-5—Therapy of Infectious Diseases
Alson E. Braley, M.D.
Iowa City, Iowa

COURSE 3

Room 713 Periods M-4, M-5

KARL W. ASCHER, M.D.
Cincinnati

Aqueous Veins in Glaucoma

A two-period course—$4.00

The aqueous veins are biomicroscopically visible pathways similar to blood vessels in appearance, containing clear, colorless fluid or diluted blood or both, and intercalated, via Schlemm's canal, between intraocular fluid and conjunctival or episcleral veins.

The detection, in 1941, of the aqueous veins confirmed the presence of a continuous elimination—and therefore production—of aqueous humor, resolving a controversy of decades and opening up new approaches to glaucoma research. The physiologic implications of these structures have been verified by numerous investigators in studies on man and animal. The control of flow appears to reside within the roots of the aqueous veins, deep in the scleral tissue, with a regulating center which is probably located in the diencephalohypophyseal area.

The qualities of the aqueous veins and their bearing on the retention theory and the neurovascular theory of glaucoma will be discussed. A motion picture will be shown.

COURSE 4

Room 721 Periods M-5, M-6

ELMER J. BALLINTINE, M.D.
LORAND V. JOHNSON, M.D.
Cleveland

Clinical Tonography

A two-period course—$4.00

The value of tonography as a practical clinical office procedure in the management of glaucoma has been established. The clinical procedure and the more common sources of errors will be demonstrated in a motion picture and discussed in sufficient detail that the observers will be able to perform the test or instruct their technicians in the procedure.

Most of the time will be spent in interpretation and discussion of tonographic data obtained in the following clinical situations:

1. Early diagnosis of glaucoma
2. Refinement of provocative tests
3. Anticipation of failure of medical therapy before field loss occurs
4. Anticipation of failure of previously successful antiglaucoma surgery
5. "Low-tension glaucoma" as a result of
   (a) decreased scleral rigidity
   (b) "arrested" glaucoma
   (c) cavernous atrophy of the nerve and related concepts

COURSE 5

Room 731 Periods T-5, T-6

BERNARD BECKER, M.D.
St. Louis
and
V. EVERETT KINSEY, Ph.D.
Detroit
BY INVITATION

Studies on Aqueous Flow

A two-period course—$4.00

Current concepts of the composition of the aqueous humor and the manner of its formation will be presented.

The rate of aqueous secretion will be discussed from the point of view of methods of measurement and induced alterations.

COURSE 6

Room 736 Periods M-4, T-4, W-4

ARTHUR J. BEDELL, M.D.
Albany

Medical Ophthalmoscopy

A three-period course—$6.00

Normal variations, congenital anomalies, and a detailed study of the changes found in hypertension, nephritis, diabetes, the blood dyscrasias, intracranial pressure, optic neuritis, and intraocular

malignant lesions will be discussed. The course will be illustrated by kodachrome photographs.

COURSE 7

Room 731 Periods M-5, M-6

RAYNOLD N. BERKE, M.D.
Hackensack, N. J.

Surgery of Oblique Muscles

A two-period course—$4.00

About 50 per cent of the cases of squint have a vertical component, and unless the hypertropia is corrected, single binocular vision is seldom achieved. Operations on the oblique muscles alone will reduce, or entirely correct, the vertical component in the majority of cases. Such operations are not difficult, do not produce changes in the width of the fissure, and generally do not result in torsional difficulties.

Slides and motion pictures will be shown illustrating the diagnosis, the surgical treatment and the postoperative results of oblique muscle surgery.

COURSE 8

Room 722 Periods M-6, T-6, W-6

MILTON L. BERLINER, M.D.
New York

Recent Advances in Biomicroscopy

A three-period course—$6.00

This course is designed for those who are already familiar with elementary biomicroscopy but who desire to gain insight into many of the benefits and problems arising from the newer techniques, especially those for examination of chamber angle, vitreous and retina. The relative values of the negative Hruby and the positive Bayadi preset lenses, as well as of all the known forms of contact lenses, e.g., Koeppe, Troncoso, Goldmann, Allen-Thorpe, and Sawar, will be demonstrated and discussed.

COURSE 9

Room 705 Periods T-5, T-6

HENRY L. BIRGE, M.D.
Hartford, Conn.
and
MORTON BEDRICK, M.D.
Fall River, Mass.
BY INVITATION
CHARLES M. BARBOUR, JR., M.D.
BY INVITATION
CHARLES E. McLEAN, M.D.
BY INVITATION
Hartford, Conn.

Vascular Diseases

A two-period course—$4.00

This course will include an application of the new techniques in the diagnosis of vascular disease to the practice of Ophthalmology.

Diabetic vascular disease, cardiac catheterization, blood volume, Dicumarol, and atheromas will be particularly mentioned. Ophthalmic diagnosis, anesthesia, geriatric surgery, thromboses in the eye and the brain will be illustrated by case reports.

COURSE 10

Room 702 Periods M-5, M-6

PAUL BOEDER, Ph.D.
Southbridge, Mass.

Practical Optics

A two-period course—$4.00

The optical properties and practical aspects of single vision and contact lenses as well as of all types of multifocal lenses will be discussed: in particular, their defects and prismatic effects, such as object displacement, image jump, vertical imbalances, and decentration. This will be followed by a discussion of cataract and telescopic lenses, and finally, by a review of the optical principles of retinoscopy, and direct and indirect ophthalmoscopy.

COURSE 11

Room 705 **Periods W-5, W-6**

GOODWIN M. BREININ, M.D.
New York

Electromyography

A two-period course—$4.00

The principles of electrophysiologic instrumentation as applied to electromyography of the extraocular muscles and to electro-oculography will be described, and the theory and applications of these techniques discussed.

There will be a brief review of neuromuscular conduction. Illustrative slides and tracings will be shown of both normal and abnormal conditions involving ocular motility: comitant and paretic strabismus, ptosis, myopathies and nystagmus.

COURSE 12

Room 721 Periods T-5, T-6

ROBERT J. BROCKHURST, M.D.
Boston
BY INVITATION

Indirect Ophthalmoscopy

A two-period course—$4.00

Direct and indirect ophthalmoscopy will be compared, and the technique of indirect ophthalmoscopy described with the aid of a short motion picture in color.

The advantages of indirect ophthalmoscopy in the study of the extreme fundus periphery will be demonstrated with slides of fundus paintings of such conditions as retinal detachment, retinoschisis, retinal cysts, neoplasms, uveitis, and intraocular foreign bodies.

This method of ophthalmoscopy will be discussed in relation to the surgical treatment of retinal detachment, certain types of small intraocular tumors, and intraocular foreign bodies.

COURSE 13

Room 795 Periods M-4, M-5, T-4 T-5, W-4, W-5, Th-4, Th-5

HAROLD W. BROWN, M.D., et al.
Eye Muscles

An eight-period course—$16.00

M-4 & 5—Physiology and Pathology of the Ocular Muscles

Harold W. Brown, M.D.
New York

The physiologic action of the individual muscles in conjugate and disjunctive movements (convergence, divergence) will be discussed and illustrated. From these normal physiologic acts, the pathologic variations will be developed and classified. Various methods of diagnosis, measurement of deviations and the surgical and nonsurgical correction of these deviations will be presented.

T-4 & 5—Congenital Anomalies

Rudolf Aebli, M.D.
New York

The subject matter will cover the more usual congenital anomalies such as retraction syndrome and its variations, strabismus fixus, Marcus Gunn jaw-winking syndrome, paralyses of both elevators of one eye with true ptosis and pseudoptosis, and also congenital individual muscle anomalies. Differential diagnosis and treatment, if any, will be discussed.

W-4—Tests

Harold W. Brown, M.D.

Tests in common use will be briefly described and the relative merits discussed. Emphasis will be placed on the screen cover test and its modifications. A practical routine muscle test will be outlined, and the technique of the various procedures will be described in detail.

W-5—Surgical Techniques in the Management of Motor Anomalies

William B. Clark, M.D.
New Orleans

A thorough understanding of the anatomy and physiology of the ocular muscles is essential before an effective technique in the surgical treatment of motor anomalies can be perfected. A discussion

of the dissection of tissues in layers, the preservation of Tenon's capsule covering the muscle, the severing of check and lateral ligaments, the use of suture materials for reattaching muscles to the sclera, and closure of the wounds will be discussed in detail.

Th-4 & 5—Surgery of the Extraocular Muscles

Harold W. Brown, M.D.
Rudolf Aebli, M.D.

The indications and contraindications for surgical correction of heterophoria and heterotropia will be discussed. Special emphasis will be placed on the methods used in selecting the proper muscle or muscles for operation and the amount of correction that can be expected from the different types of surgical procedures.

COURSE 14

Room 712 Periods W-5, W-6

BRIG. GEN. VICTOR A. BYRNES (MC)
Washington, D. C.

Ophthalmic Filters

A two-period course—$4.00

In prescribing sunglasses or tinted lenses the following factors should be considered:

a. In what kind of light will these filters be used?
b. What effects do these light wavelengths have on the eye if unfiltered?
c. What effects do the various filters have on the light distribution?
d. What is the effect on vision of the changes in the light reaching the eye?

These factors will be discussed. Other topics for discussion will include sunglasses of different shades and the advantages and disadvantages of each; tinted lenses for constant wear; types of tinted lenses advocated for night driving and their defects; tinted windshields and their transmission curves, uses and disadvantages; reflecting filters and their uses; relative merits of glass and plastic lenses; use of sunglasses with corrections for refractive errors; strength of corrections which can be ground in large-size sunglass lenses; polarizing lenses; shooting glasses; defects of clip-on lenses; filters for possible use in prevention of intraocular damage by atomic flash and other high intensity radiation.

COURSE 15

Room 752 Periods M-5, M-6, T-5, T-6, W-5, W-6, Th-5, Th-6

ALSTON CALLAHAN, M.D., et al.

Ophthalmic Plastic Surgery: Fundamental Course

An eight-period course—$16.00

Planned for ophthalmologists whose experience with lid surgery has been limited, this course is designed to teach methods for correction of the simpler lid problems as outlined by the various instructors. Those who have taken the course should be able to manage basic lid problems with confidence, and since it is integrated with the Advanced Course in Ophthalmic Plastic Surgery given by Dr. Wendell Hughes et al., it should be taken first except by those who have had extensive experience with surgical procedures on the lids.

M-5 & 6—Basic Principles
Alston Callahan, M.D.
Birmingham, Ala.

T-5—Correction of Lacerations: Immediate and Late
Byron Smith, M.D.
New York

T-6—Conjunctiva: Symblepharon; Pterygium; Repair of Conjunctival Lacerations; Reconstruction of Sockets and Fornices
Edmund B. Spaeth, M.D.
Philadelphia

W-5—Entropion; Trichiasis; Ectropion
Merrill J. Reeh, M.D.
Portland, Ore.

W-6—Blepharoptosis
Sidney A. Fox, M.D.
New York

Th-5—Enucleation; Evisceration; Exenteration; Lacrimal Apparatus
J. Gordon Cole, M.D.
New York

Th-6—Panel Discussion

COURSE 16

Room 721 Periods M-4, T-4, W-4

GRAHAM CLARK, M.D.
New York

Retinal Detachment

A three-period course—$6.00

The following outline will be utilized:

I. Types of retinal detachment and their holes: causative mechanisms, surgical approach, and prognostic significance
II. Treatment of the simple detachment, with emphasis on the electrical principles involved in the use of diathermy
III. Treatment of complicated detachments, with discussion of the various procedures for shortening the sclera

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COURSE 17

Room 706 Periods M-4, M-5

WILLIAM B. CLARK, M.D.
New Orleans

Surgery of Ocular Muscles

A two-period course—$4.00

A review of the surgical anatomy and the physiology of the ocular muscles will be presented. Effort will be made to rationalize the use of certain procedures with the anatomy and physiology of the eye muscles. The selection of the type of procedure to be followed for certain anomalies will be discussed. The preliminary preparation of the patient for surgery, the choice of the anesthetic agent, and the postoperative care of the patient will be considered.

COURSE 18

Room 713 Periods T-4, T-5

WILLIAM B. CLARK, M.D.
New Orleans

Cataract Extraction: Selection and Preparation of a Patient

A two-period course—$4.00

It is not possible to set down other than rather general principles for the selection and preparation of patients for cataract extraction. Each patient with a cataract presents an individual problem to the ophthalmologist as to temperament, state of general health, need for visual improvement, and psychological approach towards his or her difficulty. Therefore, the keynote of this course will be the individualization of the treatment of patients with cataracts, with the speaker outlining his experiences with the variations in temperament, physical stamina, and disorientation, and his suggestions as to the manner of handling individual cases.

COURSE 19

Room 782 Periods M-4, M-5, T-4, T-5

COURSE 20

Room 782 Periods W-4, W-5, Th-4, Th-5

JACK C. COPELAND
Chicago
BY INVITATION

Streak Retinoscopy

A four-period course—$8.00

This four-hour course is being presented twice, as Course 19 on Monday and Tuesday and as Course 20 on Wednesday and Thursday. **Please select course number according to days on which you wish to attend.**

The following outline describes the steps of the demonstration:

1. Determining the neutral point
2. Revealing low astigmatic errors
3. Locating the zone of the astigmatic band
4. Determining the power of the cylinder
5. Estimating the type and degree of error without lenses
6. Refining axis position by "Guide Angle" technique
7. Plus cylinder procedure

COURSE 21

Room 724 Periods M-4, M-5, M-6, T-4, T-5, T-6, W-4, W-5 W-6, Th-4, Th-5, Th-6

FRANK D. COSTENBADER, M.D., et al.

Comitant Strabismus: Physiology and Management

A twelve-period course—$24.00

This course is designed to teach the why of strabismus, as well as the what to do for strabismus. The "rule of reason" is emphasized rather than the "rule of thumb."

The order of listing of the lectures makes evident our intent to show (1) how eyes may align and see together, (2) what happens when they can no longer see together, and finally, (3) what can be done to restore them to as nearly normal function as possible.

M-4—Binocular Positions and Movements
Marshall M. Parks, M.D.
Washington, D. C.

Movements eyes make and why; positions they assume and why; the reflexes controlling these movements and positions.

M-5—Binocular Vision
Hermann M. Burian, M.D.
Iowa City, Iowa

Physiologic basis of normal binocular vision; conditions necessary for its achievement.

M-6—Dissociation and Binocular Adaptations
Frank D. Costenbader, M.D.
Washington, D. C.

What factors interrupt binocular vision; the sensory and motor adaptations to this interruption.

T-4—Sensory Adaptations
Hermann M. Burian, M.D.

Suppression, amblyopia ex anopsia, anomalous correspondence; their essence and treatment.

T-5—Accommodation-Convergence
Marshall M. Parks, M.D.

Methods of determination and norms of accommodation and convergence. The relationship of accommodation and convergence; the method by which this relationship is measured, and norms for this relationship.

T-6—Diagnostic Principles
Dan G. Albert, M.D.
Washington, D. C.

Principles underlying the tests to determine status of motor and sensory cooperation of the eyes; the essence of the various tests.

W-4—Diagnostic Techniques
Dan G. Albert, M.D.

How the tests for motor and sensory cooperation of the eyes should be performed and how variations in technique affect the result obtained.

W-5—Therapeutic Principles and Methods
Frank D. Costenbader, M.D.

The methods of achieving the goals of (1) good vision, (2) good alignment, and (3) good binocular vision.

W-6 & Th-4—Exotropia
Dan G. Albert, M.D.

The recognition and management of (1) convergence insufficiency, (2) intermittent exotropia, and (3) constant exotropia.

Th-5 & 6—Esotropia
Marshall M. Parks, M.D.

The recognition and management of (1) intermittent and (2) constant esotropia.

Throughout the course, diagnostic and therapeutic techniques will be demonstrated and discussed, and illustrative cases will be cited.

COURSE 22

Room 710 Periods M-4, M-5

JOHN H. DUNNINGTON, M.D.
ELLEN F. REGAN, M.D.
New York

Cataract Surgery: Complications Due to Defective Wound Healing

A two-period course—$4.00

A poorly healed incision may result in complications such as corneal edema, delayed restoration of the anterior chamber, late fistulization, epithelization of the anterior chamber, and secondary glaucoma. The clinical and pathologic aspects of these complications will be discussed. Emphasis will be placed upon the prevention and treatment of these conditions.

COURSE 23

Room 744 Periods T-4, T-5

GERALD E. FONDA, M.D.
Short Hills, N. J.
and
LOUISE SLOAN, Ph.D.
Baltimore
BY INVITATION

Subnormal Vision: Technique for Examination

A two-period course—$4.00

The technique for subnormal vision examination, with emphasis upon the importance of history taking, nonoptical methods of correction, and the sequence of examination procedures, including the trial of different types of lenses, will be considered.

Correction of 80 per cent of cases with subnormal vision can be accomplished from the trial case by extension of the routine eye examination. The types of lenses used are conventional lenses, strong reading additions for monocular and binocular use, doublet magnifiers, microscopic bifocals, and telescopic lenses. Bifocals with reading additions up to +32.00 diopters are successful.

Various lenses will be demonstrated, and indications for their use will be explained. Types of pathologic ocular conditions, favorable and unfavorable for correction, will be classified.

Method of testing visual acuity at 40 cm. for determining diopter power required for variable degrees of visual defect will be explained.

COURSE 24

Room 752 Periods M-4, T-4, W-4

GEORGE P. GUIBOR, M.D.
Chicago

Orthoptics: Office and Home Techniques

A three-period course—$6.00

The first hour will be devoted to a discussion of those patients with squint existing since birth or shortly thereafter. Such patients will be found to have strabismus fixus, spasmus fixus, intermittent exotropia, spastic esotropia, abducens palsy, and other oculomotor palsies.

During the second hour, heterophorias will be discussed, especially convergence insufficiencies and vertical deviations. A differential diagnosis between the heterophorias and ciliary defects will be presented.

In the third hour, visual defects seen in children and their influence on reading disturbances will be discussed.

COURSE 25

Room 750 Periods M-4, M-5

ROBERT W. HOLLENHORST, M.D.
Rochester, Minn.

Arterial Diseases as They Affect the Eye: Differential Diagnosis

A two-period course—$4.00

The first period of this course will be devoted to a general survey of the diagnosis and evaluation of hypertensive cardiovascular disease through study of the retinal arterioles and other retinal manifestations. Essential hypertension, as well as the various secondary forms of hypertension, will be discussed and correlated with clinicopathologic findings illustrated by kodachrome photographs.

During the second period, the discussions and illustrations will concern other forms of arterial and arteriolar involvement, including spastic, embolic and thrombotic retinal arteriolar lesions, manifestations of diseases of the internal carotid artery, migraine, periarteritis nodosa, temporal (cranial) arteritis, and amaurosis fugax.

COURSE 26

Room 736 Periods M-5, M-6, T-5, T-6
W-5, W-6, Th-5, Th-6

WENDELL L. HUGHES, M.D., et al.

Ophthalmic Plastic Surgery: Advanced Course

An eight-period course—$16.00

This course is designed for ophthalmologists who have had at least some groundwork in plastic surgery.

For those who have not had such training, the fundamental course given this year by Dr. Alston Callahan is sug-

gested as preliminary so that next year they will get more out of the advanced course.

M-5 & 6—Conjunctiva and Lacrimal System
Wendell L. Hughes, M.D.
Hempstead, N. Y.

Discussion of conjunctivochalasis, conjunctival grafts, burns, replacement of conjunctiva with graft of mucous membrane or skin, symblepharon, fornix reconstruction, and pterygium will be presented.

Pathologic conditions of the lacrimal system, including gland, punctum, canaliculus, sac and nasolacrimal duct will be discussed.

T-5 & 6—Congenital Anomalies and Ptosis
Deane C. Hartman, M.D.
Los Angeles

A discussion of anophthalmos, microphthalmos, colobomas, blepharophimosis, epicanthus, megaloblepharon, entropion and ectropion will be presented. Various congenital tumors, cysts, nevi and aberrant tissue deformities will be discussed. Congenital types of ptosis with repair and some attending complications will also be covered.

W-5—Entropion and Trichiasis
Joseph C. Hill, M.D.
Toronto, Ont., Canada

Principles of treatment of various aspects of entropion and trichiasis will be discussed, together with their prognosis. Charts, kodachrome slides and a short motion picture will be used.

W-6—Reconstruction of the Lower Lid
M. Noel Stow, M.D.
Washington, D. C.

Various methods will be discussed for reconstruction of different portions and amounts of lower lid defects. These include the sliding flap, tarsoconjunctival flap from the upper lid, reconstruction of the skin layer alone when the tarsus can be saved and reconstruction of the inner layer by means of a free graft of tarsus from the upper lid of the opposite eye.

Th-5—Exenteration and Enucleation
Charles E. Iliff, M.D.
Baltimore

Exenteration of the orbit will be taken up in detail, using a motion picture to demonstrate particular points.

The indications for and technique of the modified Kronlein procedure will be discussed, anatomy and operative steps being demonstrated by a motion picture.

The use of the Foster snare for enucleation will be shown and its advantages demonstrated.

Th-6—Upper Eyelid and Both Eyelids
Crowell Beard, M.D.
San Jose, Calif.

Repair of an upper eyelid is both cosmetically and functionally important. The defects occurring are ordinarily due to trauma or to tumor excision. In the latter case adequate removal of tumor tissue is of prime importance. The method of surgical repair will depend upon the size of the defect and the degree of relaxation of the involved eyelid. The smaller defects can be repaired by the halving technique or by the Minsky suture. Larger defects may require procedures utilizing a sliding flap or a bridge flap from the lower eyelid.

Simultaneous reconstruction of both upper and lower eyelids is rarely required. When such a repair becomes necessary, a combination of principles is utilized, which must be adapted to the individual case. In these instances the eye has usually, but not always, been removed. This simplifies the requirements, but the final cosmetic result is rarely pleasing.

COURSE 27

Room 722 Periods M-4, M-5, T-4 T-5, W-4, W-5, Th-4, Th-5

WILLIS S. KNIGHTON, M.D., et al.

Highlights in Glaucoma

An eight-period course—$16.00

A short course in the fundamentals of glaucoma as understood at the present time. Theoretical concepts will be given a minimum of attention so as to allow more time for the discussion of the practical phases of detection and management.

M-4—Minimum Requirements for the Detection of Early Glaucoma
Willis S. Knighton, M.D.
New York

M-5—Chronic Simple Glaucoma
Edwin B. Dunphy, M.D.
Boston

T-4—Narrow Angle Glaucoma
Paul A. Chandler, M.D.
Boston

T-5—Secondary Glaucoma
A. Gerard DeVoe, M.D.
New York

W-4—Pathology
Joseph A. C. Wadsworth, M.D.
New York

W-5—Medication
P. Robb McDonald, M.D.
Philadelphia

Th-4—Surgery
Harold G. Scheie, M.D.
Philadelphia

Th-5—Round Table Discussion

COURSE 28

Room 796 Periods M-4, M-5, T-4, T-5, W-4, W-5, Th-4, Th-5

JOHN M. McLEAN, M.D.
New York
CHARLES L. SCHEPENS, M.D.
Boston
BY INVITATION
EDWARD W. D. NORTON, M.D.
New York
ICHIRO D. OKAMURA, M.D.
Boston
BY INVITATION

Retinal Detachment

An eight-period course—$16.00

The management of detached retina will be considered from the practical standpoint. Principles and objectives of treatment will be outlined, and the means of obtaining them which have been used in the past will be reviewed. Various methods in current use will be discussed critically. Diagnosis and methods of examination, including indirect stereoscopic ophthalmology, scleral depression, and biomicroscopy of the vitreous will be covered. Uses of various electric currents and other modalities will be compared. The indications and uses of several surgical methods will be outlined and illustrated in some detail. Preoperative and postoperative management will be covered, and prognostic factors and results analyzed.

COURSE 29

Room 743 Periods M-4, M-5

RAYMOND L. PFEIFFER, M.D.
IRA S. JONES, M.D.
New York

Roentgenography of the Eye and Orbit

A two-period course—$4.00

Perhaps the most important advance in our understanding of tumors of the orbit is that which concerns those of the lacrimal gland. It is now known that not all of the epithelial growths in this structure are malignant. As a matter of fact, approximately half of these, which comprise about half of all the tumors of the gland, are benign. In addition, it is known that changes in the orbits are associated with these epithelial growths and that these changes are demonstrable by x-ray and may serve to differentiate the benign from the malignant. In this course a great variety of conditions which may affect the fossa of the lacrimal gland will be shown in differential diagnosis.

COURSE 30

Room 732 Periods M-5, M-6, T-5, T-6

DOHRMANN K. PISCHEL, M.D.
San Francisco
JOSEPH A. C. WADSWORTH, M.D.
New York
BAYARD H. COLYEAR, JR., M.D.
San Francisco

Retinal Detachment

A four-period course—$8.00

The pathologic anatomy of retinal detachment will be presented and the relation of these factors to the clinical development of the disease will be shown. Aids in diagnosis and differential diagnosis will be described. Surgical procedures, including diathermy and the various types of scleral resections, will be discussed.

COURSE 31

Room 733 Periods M-4, M-5, T-4, T-5 W-4, W-5

JAMES J. REGAN, M.D.
CHARLES D. J. REGAN, M.D.
Boston

Refraction: Its Practical Aspects and Aids in the Difficult Problems

A six-period course—$12.00

This course will show how refractive errors can be measured with the greatest precision. Opening with a review of optical principles, the course will consist chiefly of practical clinical demonstrations, using members of the class as patients. Objective and subjective approved techniques will be shown with emphasis on their comparative values, separately and in various combinations, with and without cycloplegics, in obtaining results satisfactory to both examiner and patient.

Simple methods for measuring heterophoria (extraocular muscle imbalance) and practical suggestions for handling such cases will be discussed as an important part of refraction. Tests for heterophoria for distance are a common practice but tests for near are seldom done. The importance of such a test for near and a simple accurate method for its conduct will be demonstrated.

COURSE 32

Room 706 Periods W-4, W-5

DANIEL M. ROLETT, M.D.
New York

Gonioscopy: Practical Application

A two-period course—$4.00

This course will review in detail the instrumentation essential in gonioscopy.

It will consist of individual instruction in the manual use of the various gonioscopes in use at present: Goldmann's, Allen's, Colenbrander's and others. Their advantages and disadvantages will be discussed. The course will emphasize the normal anatomy of the angle, thereby arousing instantaneous awareness of pathologic conditions when encountered.

The use of the gonioscope in (a) all injuries of the eyes, whether perforating or contusive, (b) glaucoma, all types, preoperative and postoperative, (c) congenital anomalies, and (d) inflammatory conditions of the anterior segment of the eye will be emphasized.

COURSE 33

Room 734 Periods M-4, M-5, T-4, T-5

HUNTER H. ROMAINE, M.D.
New York

Ocular Motility Surgery

A four-period course—$8.00

Surgery of the ocular motor system will be considered from several aspects:

1. The relationship of the preoperative diagnosis and of the preoperative care to the surgical procedure to be undertaken
2. Types of surgical procedures, techniques used in these procedures, and instruments and suture material used in these procedures
3. The horizontal surgical procedures and their relation to existing conditions and to purely vertical muscular anomalies, as well as to combinations of these groups
4. The complications that occur, the handling of these complications, and ways and means to obviate complications

The course will be illustrated by various motion pictures of surgical procedures.

COURSE 34

Room 744 Periods M-6, T-6, W-6

HUNTER H. ROMAINE, M.D.
New York

Difficult Problems in Refraction and Their Treatment

A three-period course—$6.00

A general review of the important problems related to refraction, including a review of the major refractive classifications, will be undertaken at the outset of this course. Following this, a thorough study of the unusual problems encoun-

tered in diseases such as aphakia, anisometropia, and amblyopia will be presented. The refractive sensitivity of an individual and its bearing on the correction prescribed, the methods used in prismatic correction in lenses, and the use of specialized lenses will be discussed. The significance of dominance and its relation to refraction will also be included in the lecture. The course is intended to be a general review of problems in refraction, including special attention to unusual problems.

COURSE 35

Room 738 Periods M-6, T-6, W-6

C. WILBUR RUCKER, M.D.
Rochester, Minn.

Neuro-ophthalmology

A three-period course—$6.00

The first period will be allotted to types of perimeters and tangent screens presently available and to techniques of their use, followed by a discussion of involvement of the optic radiations by brain tumor and occlusive vascular disease.

During the second period the various disorders in the region of the chiasm will be reviewed, with emphasis on those which are most important to the ophthalmologist.

During the third period lesions of the optic nerves and nerve heads will be considered, with special attention to those vascular disorders which may simulate papilledema and glaucoma.

COURSE 36

Room 734 Periods W-5, W-6

ROBERT A. SCHIMEK, M.D.
Detroit
FRANKLYN P. BOUSQUET, M.D.
Savannah, Ga.

Clinical Gonioscopy and Tonography

A two-period course—$4.00

1. Demonstration of Techniques
   Human subjects will be utilized for demonstration of gonioscopy and tonography. Their aqueous-outflow constants will be determined. Members of the group may use each of the various gonioprisms with the slit lamp and the goniolens with the gonioscope on human subjects.
2. Clinical Applications
   Landmarks of normal and abnormal angles as they actually appear during gonioscopy will be shown by means of stereoscopic slides.

The theory and practical applications of tonography will be presented. Emphasis will be placed on correlation of gonioscopic and tonographic findings in determining diagnosis, treatment, and prognosis of various types of glaucoma in a series of patients.

ALBERT E. SLOANE, M.D.
Boston
BERNARD C. GETTES, M.D.
Philadelphia

Refraction

The following three courses dealing with Refraction, Course 37, Course 38 and Course 39, will be under the direction of Albert E. Sloane, M.D. They may be purchased jointly or separately as your schedule permits.

COURSE 37

Room 740 Periods M-4, M-5

School Vision Testing: Program, Problems and Methods
Albert E. Sloane, M.D.

A two-period course—$4.00

This course will provide the ophthalmologist with background for this important phase of public health work. In recent years increasing emphasis is being placed on such programs throughout the country, and the eye doctor is often asked to act either in an advisory capacity or in the actual setting up of such procedures. Various methods of testing will be demonstrated and their present relative merits discussed. Other important problems involved in such programs will be discussed.

COURSE 38

Room 740 Periods T-4, T-5

Telescopic Lenses and Other Aids for Subnormal Vision

Albert E. Sloane, M.D.

A two-period course—$4.00

In this course the ophthalmologist will be given an appreciation of the value and of the limitations of telescopic lenses and simple methods of testing their usefulness. Techniques for utilizing the various types of lenses now available will be demonstrated. Many other aids for increasing the size of the retinal image are available, easily fitted, and quite inexpensive. These will also be presented with relation to their clinical application.

COURSE 39

Room 740 Periods W-4, W-5

Bernard C. Gettes, M.D.

A two-period course—$4.00

A. Criteria for Prescription of Prisms in Ophthalmic Practice

A working formula for guidance in prescribing prisms will be presented. The standard textbook can only generalize regarding this phase of treatment, since all cases must be considered individually. Nevertheless, some system of guidance is desirable and helpful, even though subject to error. Our classification of heterophorias will indicate in which cases prisms should be prescribed and how the strength of the prism may be determined.

B. Drugs Used in Refraction

The place of cycloplegia in refraction has always been a controversial subject. Its advantages and shortcomings will be presented with indications and contraindications for its use. The relative merits of the several cycloplegics and the best methods for their administration will be considered. Miotics will be discussed, and their effect in accommodative strabismus will be considered.

COURSE 40

Room 710 Periods T-4, T-5

ELLIS H. STEFFENSEN, M.D.
and
RICHMOND SMITH, M.D.
BY INVITATION
Detroit

Corticotropin and the Various Synthetic Steroids: Contraindications, Complications, and Clinical Value

A two-period course—$4.00

Indications for the use of corticotropin and the various synthetic steroids in the treatment of ocular diseases will be discussed.

Currently accepted therapeutic programs for the treatment of acute and chronic lesions will be outlined, together with the precautionary measures necessary for the protection of the patient from possible adverse pharmacologic side effects. The physiologic basis for the use of these drugs in the treatment of various ocular lesions will be briefly reviewed.

COURSE 41

Room 712 Periods M-5, M-6

M. NOEL STOW, M.D.
L. CONNER MOSS, M.D.
Washington, D. C.

Diagnostic and Therapeutic Office Procedures

A two-period course—$4.00

Pathologic conditions requiring medical or surgical treatment which are encountered in office or clinic practice will be discussed. They are neither rare nor routine, but their early detection or effective management may present some difficulty.

During the first hour, practical study will be made of such problems as ophthalmic pain, detection of holes in the retina prior to detachment (direct ophthalmoscopy), herpes zoster, persistent twitching of the orbicularis, and daily use of mydriatics in cases of early cataract.

Included in the second hour will be discussion of the surgical treatment of chalazia, xanthelasmas, hemangiomas, papillomas, dyskeratoses, melanomas, and basal cell and squamous cell carcinomas.

Kodachrome slides will be used for illustration.

COURSE 42

Room 754 — Periods M-4, M-5, M-6, T-4, T-5, T-6, W-4, W-5, W-6, Th-4, Th-5, Th-6

GEORGIANA D. THEOBALD, M.D., et al.
Histopathology

A twelve-period course—$24.00

The teaching will be by lecture, microprojection and microscope. It is recommended that the student review the normal histology of the eye before attending this course.

The Cornea

Frederick C. Blodi, M.D.
Iowa City, Iowa

The normal histology will be reviewed. The anatomical picture will be correlated with the slit lamp examination of the cornea. The problem of corneal transparency will be discussed from an anatomical, chemical and physical point of view.

The general pathology of the cornea will be taken up in the following order: corneal edema, vascularization, keratitis, wound healing, epithelial changes and changes in Descemet's membrane and on the posterior corneal surface.

The specific pathology will include a discussion of suppurative and nonsuppurative keratitis, senile changes, corneal degenerations, and pigmentations.

The Proper Method of Evaluation of Ocular Tissue

Frederick R. Carriker, M.D.
Phoenix, Ariz.

This presentation will be concerned with the methods of examining ocular pathological tissue. The discussion will include the gross appearance of the various types of eye specimens sent to the eye pathology laboratory. A motion picture will be used to emphasize various points in the discussion.

Pathogenesis of Some Intraocular Surgical Complications

Leonard Christensen, M.D.
Portland, Ore.

This presentation will be concerned with the pathogenesis of tissue alterations which result from complications of the more common intraocular surgical procedures. The discussion will include the factors which lead to failure in filtration operations for glaucoma, such postoperative complications as retinal detachment and epithelization of the anterior chamber, and the effects of vitreous loss during cataract extraction. Representative microscopic slides will be available for study.

Pathology of the Optic Nerve

Windsor S. Davies, M.D.
Detroit

A classification of the pathologic changes as observed in the optic nerve will be presented. Various lesions will be demonstrated by lantern slides. A correlation will be made between clinical and pathologic findings.

Tumors of the Orbit

Arnold W. Forrest, M.D.
White Plains, N. Y.

There will be a discussion of the pathologic characteristics of orbital tumors and the clinical conditions which result from them. The seven most common types, which comprise 75 per cent of primary orbital tumors, will be studied in detail. Sections will be provided for microscopic examination.

Pathology of the Lens

Michael J. Hogan, M.D.
San Francisco

The purpose of this lecture will be to present the normal histology of the lens and the etiology and pathogeny of cataractous changes. The histopathology will be described in detail, including changes in the capsule, lens epithelium, and lens fibers. Senile cataract in its various manifestations will be discussed from a clinical and pathologic standpoint. Cataracta complicata of the posterior and anterior types will be demonstrated. Diabetic and metabolic cataracts will be discussed.

Hypertensive, Nephritic, Diabetic and Arteriosclerotic Retinopathy
A. Ray Irvine, Jr., M.D.
Beverly Hills, Calif.

Celloidin sections of eyes showing the retinopathy typical of hypertension, nephritis, diabetes and arteriosclerosis will be presented for microscopic study. When possible, the newer stains demonstrating mucoproteins and fixed polysaccharides will be used. The lecture will consist of an explanation of the slide material and a discussion of the pathologic physiology.

Tumors of the Uvea
John S. McGavic, M.D.
Bryn Mawr, Pa.

All of the tumors involving the uveal tract will be discussed and illustrated. Both primary and secondary tumors will be included. Most of the time will be devoted to benign and malignant melanomas, as they are the most common. Nevi, neurofibromas, hemangiomas, leiomyomas, xanthoendotheliomas, lymphomas and various metastatic tumors will be presented. Microscopic sections will be available for study as well as for projection.

Tumors of the Retina
Edith Parkhill, M.D.
Rochester, Minn.
BY INVITATION

The gross and microscopic pathology of retinoblastoma will be presented with the aid of lantern slides. Factors in etiology and prognosis will be considered; when the cases are classified according to certain factors in the history and microscopic findings, it is found that the survival rate in one group is almost 100 per cent.

Pathology of Glaucoma
Theodore E. Sanders, M.D.
St. Louis

The essential changes produced in the tissues of the eye by increased intraocular pressure will be presented. The various lesions causing secondary glaucoma will also be described. The mechanisms which may cause both primary and secondary glaucoma will be discussed.

Cells Found in Inflammatory Lesions
Georgiana D. Theobald, M.D.
Oak Park, Ill.

Cytology, pathology and sequelae of ocular inflammations will be discussed.

Granulomatous Infections of the Eye
Lorenz Zimmerman, M.D.
Washington, D. C.
BY INVITATION

Among the many different causes of "granulomatous inflammation" involving ocular tissues are infectious agents which may be demonstrated histologically within the eye. These include nematode larvae, Toxoplasma, tubercle bacilli, leprosy bacilli, Treponema, inclusion bodies, and fungi such as Blastomyces and Cryptococcus. None of these are demonstrated with ease since a prolonged search of serial sections is necessary in some cases and special staining techniques are required in others.

"Granulomatous inflammation" is a term preferred to "granulomatous uveitis" since in many of these infections the process is neither primarily nor predominantly uveal. Sympathetic ophthalmia is the only type of granulomatous inflammation that is a true uveitis.

COURSE 43

Room 744 Periods M-4, M-5

HARVEY E. THORPE, M.D.
Pittsburgh

Surgery of Intraocular Foreign Bodies

A two-period course—$4.00

A comprehensive survey of established and newly developed techniques for the removal of foreign bodies from the eyeball will be presented.

Magnetic and nonmagnetic intraocular foreign bodies create special surgical problems. Accurate determination of functional and anatomic damage is important. Methods for evaluation of extent of trauma to ocular tissues and of impairment of vision will be analyzed.

Location of foreign bodies by roentgenograms must be accurate for successful surgery. The electroinductive locator is a distinct help in foreign body localization both before and during operation. These methods of localization will be elaborated in this course.

The surgical technique for removal of foreign bodies must be properly planned from incision to closure. Techniques for removal of foreign bodies from the anterior chamber, iris, lens, ciliary body, vitreous, and retina will be reviewed.

There will be a discussion of the management of associated complications, such as laceration, uveal and vitreous prolapse, traumatic cataract, retinal detachment and infection. A review of preoperative and postoperative care will be included.

COURSE 44

Rooms 788 & 789 Periods M-4, M-5 M-6, T-4, T-5, T-6, W-4, W-5, W-6

HARVEY E. THORPE, M.D.
Pittsburgh

ROBERT J. MASTERS, M.D.
Indianapolis

ALEXANDER A. KRIEGER, M.D.
Pittsburgh

JOHN MELVIN MASTERS, M.D.
Indianapolis

SAMUEL N. KEY, M.D.
Austin, Texas

FRED M. WILSON, M.D.
Carmel, Ind.

Slit Lamp Biomicroscopy: Fundamentals

A nine-period course—$18.00

This course deals with the important fundamentals of slit lamp microscopy. Much time will be given to making the registrants familiar with the manipulation of the newer instruments. Illustrated lectures which describe biomicroscopic studies of the normal and pathologic cornea, anterior chamber, iris, crystalline lens and vitreous humor will be followed by demonstrations and practice periods with a variety of biomicroscopes. However, the more thorough training of ophthalmologists during the past several years has definitely changed the needs of those who register for this course. The instructors have correspondingly changed its curriculum to accommodate practitioners who have had experience with the instruments but who wish to perfect themselves also in some of the fundamentals as applied to recent developments.

Beginners are welcome in this course! Some of the teaching group get great satisfaction from guiding the novice through his first steps in the use of this indispensable instrument, and it has been our experience that almost every beginner develops satisfactory proficiency before our working time is completed.

COURSE 45

Rooms 788 & 789 Periods T-4, Th-5, Th-6

HARVEY E. THORPE, M.D.
Pittsburgh

ROBERT J. MASTERS, M.D.
Indianapolis

ALEXANDER A. KRIEGER, M.D.
Pittsburgh

JOHN MELVIN MASTERS, M.D.
Indianapolis

FRED M. WILSON, M.D.
Carmel, Ind.

SAMUEL N. KEY, M.D.
Austin, Texas

Advanced Slit Lamp Biomicroscopy: Recent Developments

A three-period course—$6.00

1. Use of Hruby lens
2. Use of flat contact lens for slit lamp ophthalmoscopy
3. Slit lamp ophthalmology and cycloscopy with 4-mirror gonioprism and Goldmann 3-mirror lens

These illustrated lectures will be fairly comprehensive. They will cover the new techniques in cycloscopy, the study of the equatorial region of the crystalline lens, and the examination of the extreme retinal and vitreous periphery. The study of the posterior vitreous and retina with the Hruby lens and with the contact lens, as well as with the gonioprism and biomicroscope will be included in this course.

The first two periods of the course will be devoted to illustrated lectures and discussion. The last period will be spent in the demonstration room, where the

students will be afforded practice with the new instruments utilized in making examinations of the lens periphery and posterior vitreous. Slit lamp ophthalmoscopy of the central and peripheral retina, which is a recent development, will be stressed; it is especially valuable in finding vitreous bands and peripheral retinal tears, as well as in the differential diagnosis of retinal pathologic changes.

COURSE 46

Room 793 Periods T-4, T-5, T-6, W-4, W-5, W-6

HARVEY E. THORPE, M.D.
Pittsburgh
HERMANN M. BURIAN, M.D.
Iowa City, Iowa
and
LEE ALLEN
Iowa City, Iowa
BY INVITATION

Slit Lamp Gonioscopy

A six-period course—$12.00

Slit lamp gonioscopy is essentially a major subdivision of biomicroscopy. This course, intended for the advanced student, will cover the subject of clinical gonioscopy. The original methods of gonioscopy will be covered in outline form. The newer methods of slit lamp gonioscopy employing contact prisms and reflecting contact lenses yield more information than methods not employing the slit lamp. They will be covered in detail.

The following subjects will be included in the discussion:

1. Angle microanatomy and some phases of angle development
2. Gonioscopic instrumentation
3. Correlation of the slit lamp gonioscopic view with histoanatomy
4. The normal angle
5. Congenital anomalies
6. Degenerative changes
7. Inflammatory diseases
8. Glaucoma and observations following operation for glaucoma
9. Cysts and tumors visible with the gonioscope
10. Observations following intraocular surgery
11. Trauma and foreign bodies of the angle

One period will be devoted to practical demonstration of gonioscopy with the slit lamp biomicroscope.

COURSE 47

Room 786 Periods W-5, W-6

C. DWIGHT TOWNES, M.D.
Louisville, Ky.

Cataract Surgery: Complications

A two-period course—$4.00

The first period of this course will deal with the prevention of complications in cataract surgery. The importance of meticulous attention to details in the preparation of the patient, in the performance of the operation, and in the postoperative care will be emphasized.

The second period will be devoted to treatment of complications; particularly, loss of anterior chamber with or without detachment of the choroid, uveitis, suppurative infection of the wound, secondary glaucoma, and changes in the hyaloid.

COURSE 48

Room 728 Periods M-5, M-6, T-5, T-6, W-5, W-6, Th-5, Th-6

RICHARD C. TROUTMAN, M.D., et al.

Recent Advances in Ophthalmology

An eight-period course—$16.00

This course is designed to present to the practicing ophthalmologist a short review of developments during the past year in the areas discussed, with an evaluation of these developments at the clinical level. The Eye Clinics of the State University of New York are so organized as to have specialties within the specialty of ophthalmology under separate departmental chairmen. These chairmen will present their particular interests in critical review. The various lectures will include therapeutics relative to the subject. The course will be completed by a review of the histopathologic changes involved in the various condi-

tions discussed, with special reference to new entities, and the relation of the disease to clinical practice. There will be a 10-minute question period at the end of each lecture during which free discussion will be encouraged. Visual aids will be used to illustrate many techniques and diseases.

M-5—Retinal Detachment
Morton Rosenthal, M.D.
Brooklyn
BY INVITATION

A discussion of the newer techniques in operations for retinal detachment will be given, and an evaluation of these techniques with special reference to the newer techniques of scleral shortening and vitreous transplantation will be made.

M-6—Strabismus
Abraham Schlossman, M.D.
New York

The newer concepts of strabismus surgery and diagnosis with reference to the use of orthoptics will be presented. The clinical applications of electromyography will be discussed.

T-5—Glaucoma and Perimetry
Seymour Goodstein, M.D.
Bayside, N. Y.

Methods of diagnosis and treatment of glaucoma will be discussed in the light of recent developments in the field, with special reference to the clinical application of new therapeutic agents such as Diamox and the use of tonography as a clinical instrument in the evaluation of glaucoma. Some reference will be made to perimetry and its application to diagnosis and treatment of glaucoma.

T-6—Lid and Plastic Surgery
Peter H. Ballen, M.D.
Hempstead, L. I., N. Y.

New developments in the field of lid and plastic surgery will be presented with special reference to treatment of chemical burns of the eye and certain newer reconstructive techniques for replacement of tissues following excision of tumor.

W-5—Pediatric Ophthalmology
Austin I. Fink, M.D.
Brooklyn

This new ophthalmologic specialty, which is rapidly developing, presents many interesting problems. Some new entities will be discussed. The author's method of handling pediatric patients will be presented.

W-6—Cornea and Lens
Richard C. Troutman, M.D.
Brooklyn

Diagnosis and medical and surgical therapy of diseases of the cornea and lens in the light of recent developments will be presented, with special reference to corneal and cataract surgery.

Th-5—Uveitis
Stanley Masters, M.D.
Roslyn, L. I., N. Y.

A discussion of uveitis, its diagnosis, treatment and the management of complications resulting therefrom will be presented, together with recent advances and their clinical application.

Th-6—Histopathology
Gerald B. Kara, M.D.
New York

A summary of histopathology in relation to clinical disease with special reference to the conditions discussed in previous lectures will be presented. Clinical applications will be stressed.

COURSE 49

Room 726 Periods T-4, T-5

RICHARD C. TROUTMAN, M.D.
Brooklyn

Enucleation Surgery: Complications and Their Management

A two-period course—$4.00

Interest in enucleation surgery has received impetus in recent years due to the development of new implants and prosthetic techniques. These materials and techniques have imposed problems which have not been seen in large numbers by the average ophthalmologist. The added interest in this problem has made it possible for some of us to see and treat enucleation complications. A summary of our experience in the field will be presented, with accompanying case presentations and a motion picture demonstration of operative repairs.

In addition, the newer methods of prosthetic fitting will be presented by Mr. Hugh Laubheimer, emphasizing the close cooperation that is now present and which is necessary for the proper care of the patient with an enucleated eye.

COURSE 50

Room 727 — Periods M-4, M-5, T-4 T-5, W-4, W-5

MAYNARD C. WHEELER, M.D.
PHILIP KNAPP, M.D.
New York

Concomitant Strabismus: Diagnosis and Treatment

A six-period course—$12.00

The practical handling of concomitant strabismus will be fully discussed. This will include methods of examination, measurement of the deviation, diagnosis, and sensorial evaluation of convergent and divergent strabismus. The medical treatment, the indications for surgery, the choice of operation, and the postoperative treatment will be considered in detail.

COURSE 51

Room 776 — Periods M-4, M-5, M-6, T-4, T-5, T-6, W-4, W-5, W-6, Th-4

Home Study

A ten-period course—$20.00

These discussion periods will be based on lesson material in the Home Study Course in Ophthalmology and will be conducted by the Home Study Course faculty. They will provide a review of basic subjects and will present up-to-date clinical applications.

This course may be attended without fee by current subscribers to the Home Study Courses. Complimentary tickets may be secured by writing to the Home Study Courses office.

M-4—Embryology, Anatomy and Neuro-Anatomy

Raymond E. Meek, M.D.
New York

John Woodworth Henderson, M.D.
Ann Arbor, Mich.

M-5—Physiology

Irving H. Leopold, M.D.
Philadelphia

Robison D. Harley, M.D.
Atlantic City

Hendrie W. Grant, M.D.
St. Paul, Minn.

George P. Guibor, M.D.
Chicago

M-6—Optics and Principles of Biomicroscopy

Arthur Linksz, M.D.
New York

Edwin F. Tait, M.D.
Norristown, Pa.

T-4—Refraction

Manuel L. Stillerman, M.D.
Chicago

Bernard C. Gettes, M.D.
Philadelphia

Frank W. Newell, M.D.
Chicago

T-5—External Diseases, Bacteriology and Virology

Samuel N. Key, M.D.
Austin, Texas

Henry F. Allen, M.D.
Boston

Samuel J. Kimura, M.D.
Berkeley, Calif.

James H. Allen, M.D.
New Orleans

T-6—Perimetry and Neuro-ophthalmology

Placidus J. Leinfelder, M.D.
Iowa City, Iowa

Robert W. Hollenhorst, M.D.
Rochester, Minn.

Cecil W. Lepard, M.D.
Detroit

W-4—Extraocular Muscles

Hunter H. Romaine, M.D.
New York

Hermann M. Burian, M.D.
Iowa City, Iowa

Conrad Berens, M.D.
New York

W-5—Ophthalmoscopy and Medical Ophthalmology

William Banks Anderson, M.D.
Durham, N. C.

Frank C. Winter, M.D.
Menlo Park, Calif.

W-6—Pathology

John S. McGavic, M.D.
Bryn Mawr, Pa.

Joseph A. C. Wadsworth, M.D.
New York

Michael J. Hogan, M.D.
San Francisco

Georgiana D. Theobald, M.D.
Oak Park, Ill.

Th-4—Pharmacology and Therapeutics

Kenneth C. Swan, M.D.
Alfred J. Kreft, M.D.
Portland, Ore.

INDIVIDUAL COURSES — OPHTHALMOLOGY

COURSE 101

Room 711 Period M-4

C. KNIGHT ALDRICH, M.D.
Chicago
BY INVITATION

Emotional Problems in the Ophthalmologist's Patients

The hour will be devoted to a discussion of the causes, symptoms and appropriate treatment of emotional factors in patients seen by the ophthalmologist. The following specific subjects will be covered:

1. General symptomatic manifestations of emotional tension
2. Psychophysiological reactions and the eye
3. Visual hypochondriasis
4. Conversion reactions, such as hysterical blindness
5. The impact of organic disease of the eye
6. Signs of psychosis, with particular reference to visual hallucinations

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COURSE 102

Room 702 Period M-4

JOSEPH E. ALFANO, M.D.
Chicago

Angiography in Ophthalmology, Including the Internal Carotid Syndrome

Arteriography of the internal carotid artery has now become a part of the diagnostic armamentarium of the clinical ophthalmologist for selected and specific cases.

The anatomy of the visual pathway as it pertains to the cerebral and ocular vascular supply will be reviewed. The technique, indications, and contraindications, as well as the ocular and systemic complications of this procedure, will be discussed. Treatment of complications will also be presented.

The value of certain features seen on the preliminary roentgenograms of the skull and orbit in selecting cases for diagnostic arteriograms will be stressed. Normal and abnormal arteriograms will be shown with illustrative neuro-ophthalmological cases.

COURSE 103

Room 705 Period M-5

HENRY F. ALLEN, M.D.
Boston

Aseptic Technique in Ophthalmology

Principles of asepsis in relation to ocular surgery and office technique will be discussed. The difference between complete and incomplete sterilization will be emphasized. Special reference will be made to instrument sterilization, degerming the skin surface, preparation and preservation of ophthalmic preparations, and control of airborne organisms.

COURSE 104

Room 705 Period M-4 or T-4

MOACYR E. ALVARO, M.D.
Sao Paulo, Brazil

Uveitis: Etiology and Treatment

The main subject for discussion will be chronic endogenous uveitis. Topics for consideration will include the incidence of uveitis and its clinical diagnosis by modern methods of examination. The differential diagnosis of granulomatous and nongranulomatous types of uveitis will be discussed with a consideration of the subjective and objective symptoms of each group. The difficulty of establishing an etiologic diagnosis will be elaborated, and the laboratory procedures and skin tests useful for this purpose will be described. Present-day knowledge of the pathogeny of the disease as a basis for treatment will be reviewed. A practical

approach toward early treatment, etiologic diagnosis and final treatment of the true etiologic factors will be presented.

COURSE 105

Room 795 Period M-6

BENNETT Y. ALVIS, M.D.
St. Louis

Glaucoma Surgery: Long-term End Results

This study will present the course of the diseases and end results in eyes that have been operated on for various types and stages of glaucoma. It will be based largely on experience with a considerable number of private patients whose cases were followed for varying lengths of time up to thirty or more years. Some comparisons will be made with eyes treated for similar periods by nonsurgical means.

COURSE 106

Room 733 Period M-6 or T-6

MARIO AMENABAR, M.D.
Santiago, Chile

Retinal Detachment: Localization and Closure of Tears

To localize the tear, a specially devised transilluminator is applied in the corresponding sector of sclera. When the hole is visualized, another instrument fixes the luminous end of the localizer, leaving a clear mark on the sclera that corresponds exactly to the situation of the tear.

Diathermy is used only when the operator knows exactly where the tear is situated so that it can be circumscribed, leaving the eye with a minimum of coagulation.

To close the tear the scleral area about the hole is treated with a small ball electrode, making independent applications that are not strong enough to close the tear and that are supplemented by very fine penetrating applications surrounding the hole. These intrascleral applications help in evacuating the subretinal fluid and will not perforate the retina.

Two new instruments, the retinal tear localizer and the scleral marker, will be shown; and two new electrodes will be exhibited.

COURSE 107

Room 711 Period M-5 or T-5

J. MASON BAIRD, M.D.
Atlanta

Lesions of the Orbit: Differential Diagnosis

A discussion of the diagnostic values and limitations of radiography of the orbit combined with air injection and the use of contrast media. An evaluation of the somewhat controversial method of orbitometry will be made, and the value and dangers of orbitography will be discussed. Differential diagnosis using the indicated techniques for the more common orbital lesions will be outlined. Kodachrome illustrations of pertinent cases will be shown.

COURSE 108

Room 712 Period M-4

ROBERT E. BANNON
Southbridge, Mass.
BY INVITATION

Aniseikonia: Its Role in Refractive Problems

Every new correction of refractive errors changes the seeing conditions to which the patient has become accustomed. The magnitude of these changes and the patient's tolerances determine whether or not binocular vision will be comfortable and efficient. Aniseikonia ("not-equal-images") is one condition which may arise. It is most frequently associated with the correction of unequal refractive errors, and in certain cases it can cause persistent discomfort.

A brief review of aniseikonia and space eikonometry will be followed by a discussion of various clues and procedures that are useful in detecting aniseikonia in routine office practice.

COURSE 109

Room 705 Period M-6

WALTER H. BENEDICT, M.D.
Knoxville, Tenn.

Atrophic Changes of the Iris

A brief resume of the embryology and anatomy of the iris, with particular emphasis on its blood supply and the anatomic distribution of the vessels, will be followed by a discussion of the various kinds of iris atrophy and their cause. A classification of iris atrophy will be presented, and the effects of aging, inflammation, trauma, glaucoma, and irradiation will be defined. The problem of primary progressive iris atrophy will be reviewed in the light of present knowledge.

COURSE 110

Room 796 Period T-6

CONRAD BERENS, M.D.
New York

Cyclodiathermy, Cycloelectrolysis, Iridencleisis and Cyclodialysis

The indications and contraindications for surgery, techniques pertaining to the various procedures, the evaluation of postoperative results and complications of cyclodiathermy, retrociliary diathermy, cycloelectrolysis, iridencleisis and cyclodialysis will be presented as exemplified by cases observed from one to eleven years.

It will be stressed that the statistical evaluation of a successful surgical procedure for glaucoma should be based upon (1) control of tension within normal limits without the use of miotics, or satisfactory control of tension with miotics; (2) increase in or preservation of the preoperative visual acuity and visual fields postoperatively, and (3) the absence of immediate or long-range complications.

These data were compiled from five hospitals, from case histories of private patients of several ophthalmologists and from personal experience.

COURSE 111

Crystal Room Period M-4

CONRAD BERENS, M.D.
New York

Ophthalmic Surgery: New Procedures

The following techniques for intraocular and extraocular surgery will be described, as well as some of their indications, contraindications and postoperative results:

1. Evisceration and enucleation using hollow plastic implants capped with steel mesh, suture grooves, braided white nylon sutures and new steel needles.
2. Lamellar keratoplasty and total transplantation of the cornea.
3. Correction of retinal detachment by various methods, including internal and external buckling of the sclera.
4. Resection and advancement of the levator for ptosis.
5. Transplantation of the superior oblique for third nerve paralysis.
6. Retroplacement of the superior oblique.
7. Subconjunctival closure of cataract wounds.

Experience with the Ridley and Stampelli lenses will be presented.

COURSE 112

Room 784 Period M-4

JEROME W. BETTMAN, M.D.
San Francisco

Radioactive Isotopes

This course is designed for the practicing ophthalmologist who wishes to understand something of radioisotopes.

First: A very simple, easily comprehensible explanation of the fundamentals of radioisotopes: A, B, and G emissions; half life; differences in energy. Conditions under which only pure B emitters are useful in diagnosis and experimental work in ophthalmology will be discussed.

Second: A brief consideration of the place and value of radioisotopes in therapy and in diagnosis, including the use and abuse of P^{32} in the diagnosis of intraocular neoplasms.

Third: The experimental use of radioisotopes as an indication of the blood volume of the choroid and retina. This sheds considerable light on which agents actually dilate the intraocular blood vessels and which do not. Deductions of very practical clinical significance will be made.

COURSE 113

Room 784 Period T-4

JEROME W. BETTMAN, M.D.
San Francisco

Value of Goniotomy

This course will consist of a practical, thorough, clinical discussion of congenital glaucoma.

The diagnosis, differential diagnosis, and prognosis of congenital glaucoma will be reviewed. Evidence will be presented to demonstrate that goniotomy is the procedure of choice in congenital glaucoma. Each of the modern techniques of goniotomy will be presented, including goniotomy without visual control, goniotomy with a contact lens, and goniotomy while air is continuously injected. Their merits will be compared, and the preoperative and postoperative care will be considered.

Goniotomy is one of the great surgical advances in modern ophthalmology. It has already saved many from a life of total blindness.

COURSE 114

Room 743 Period W-6

HAROLD M. BLOCK, M.D.
Dallas

The Office Practice of Ophthalmology

In this course it is our intention to explain various types of office procedures for medical and surgical conditions, with the patients' reaction in mind, and in such a way as to have better patient-doctor relationships. Procedures learned in the clinics and hospitals will be explained from the viewpoint of their application in private practice. The course is especially designed for the young ophthalmologist.

COURSE 115

Room 706 Period Th-4

G. BONACCOLTO, M.D.
New York

Present Status of Enucleation Techniques

Following a brief description of several of the newer innovations in the enucleation technique, this course will include a discussion of the different types of implants in use today and their relative advantages and disadvantages on the basis of (1) technique of muscle attachment to implant; (2) durability; (3) complications during and after the operation. The lecture will be illustrated with slides and motion pictures in color.

COURSE 116

Room 793 Period M-4

WILLIAM F. BONNER, M.D.
New Orleans

Vascular Retinopathy: Differential Diagnosis

The Keith-Wagener classification of four grades in hypertensive retinitis has been in extensive use in recent studies associated with cardiac therapy.

In the exhibit of "Hans Lauber's Ophthalmoscopy in Red-Free Light" at the Academy in 1955, attention was called to Hans Lauber's previous demonstration of the following types of cases:

1. Normal fundus
2. Arterial changes
3. Retinal hemorrhages and exudates
4. Papilledema

Eight lantern slides, four regular ophthalmoscopic slides and four in red-free light, have been prepared to show these changes.

A study has been made showing the association of the Kuhnt-Junius syndrome (paramacular retinochoroiditis) with grade 3 (hemorrhagic retinitis).

COURSE 117

Room 793 Period M-6

ALBERT L. BROWN, M.D.
Cincinnati

Fever Therapy in the Light of Recent Drugs, Especially Antibiotics and Corticosteroids

Occasionally an effective form of therapy is replaced by newer methods of treatment, only to be reinstated later. Sulfonamides, antibiotics, and later, the corticosteroids were quickly admitted to ocular therapy. Their distinctive uses were gradually cataloged and found to have definite limits. These limitations left many conditions in which fever therapy was still considered to be the method of choice. Antibiotics were found to be of no use in many diseases of the cornea, iris, and uveal tract. Cortisone later was thought to be almost specific for nonspecific iritis and uveitis. It was then realized that many types of ocular disease, especially of posterior segment inflammation, did not yield to the corticosteroids. In this course, I will discuss my return in the last ten years to the use of typhoid H antigen for certain diseases of the cornea, uveal tract, retina, and optic nerve in which the newer drugs have failed.

COURSE 118

Room 734 Period M-6 or T-6

F. PHINIZY CALHOUN, JR., M.D.
Atlanta

Epithelization of the Anterior Chamber: Diagnosis and Treatment

A review of the pathogenesis, incidence, and histopathology of this condition, with detailed discussion of the clinical manifestations and recent developments in diagnostic tests and methods of treatment.

COURSE 119

Room 711 Period M-6

FRANK D. CARROLL, M.D.
New York

Optic Nerve Lesions: Differential Diagnosis

Lesions of the optic nerve must be first differentiated from lesions caused by intracranial expanding lesions and disorders of the macula. Then an etiologic differential diagnosis of the optic nerve condition must be sought. This includes consideration of conditions which are inflammatory, degenerative, vascular, neoplastic, or toxic. An outline of the author's approach to this problem will be presented.

COURSE 120

Room 705 Period W-4 or Th-4

J. V. CASSADY, M.D.
South Bend, Ind.

Dacryocystitis and Lacrimal Drainage

Consideration will be given to dacryocystitis, excessive lacrimation, and lacrimal duct obstruction in adults as well as in infants. Kodachrome illustrations of anatomy, embryology, and pathogenesis of lacrimal drainage problems will be shown. Clinical examination, diagnoses, and treatment will be discussed. Irrigation, probing, palliative treatment, and the use of polyethylene tubing will be considered. A film presenting the Dupuy-Dutemps method of dacryocystorhinostomy will be shown.

COURSE 121

Room 702 Period T-4

J. V. CASSADY, M.D.
South Bend, Ind.

Toxoplasmic Retinochoroiditis

The widespread prevalence of toxoplasmosis in man and animal has caused confusion as to its importance in the etiology of retinochoroiditis. The intelligent treatment of retinochoroiditis should be directed to its cause. Clinical, roentgenologic and serologic study of these patients is mandatory before embarking upon treatment with such dangerous drugs as pyrimethamine and sulfadiazine. Skin tests, blood studies, dye tests, and a thorough understanding of the patient must precede therapy directed against toxoplasmosis.

COURSE 122

Crystal Room Period W-6

RAMON CASTROVIEJO, M.D.
New York

Corneal Surgery: Results

Keratoplasty may give a very high percentage of successful results when a suitable technique is used in favorable cases. The more unfavorable the condition of the eye in which a corneal transplantation is to be performed, the less likely is the transplant to remain clear.

In order to evaluate more accurately the results obtained in corneal surgery, cases will be studied in four different groups:

1. Favorable cases
2. Less favorable cases, but likely to give a fairly high percentage of good results
3. Unfavorable cases
4. Unfavorable cases rendered more favorable for a final optical keratoplasty by conjunctival plastic repair, keratectomy, or keratoplasty

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COURSE 123

Room 728 Period M-4

WEBB P. CHAMBERLAIN, JR., M.D.
Cleveland

Vertical Motor Anomalies

The surgical anatomy and physiology of the vertical muscles will be discussed, and emphasis will be placed on the importance of careful analysis in the cardinal positions of gaze. The objective methods of testing will be stressed, including properly executed excursions, measurements with prisms, and the head tilt test. Motion pictures will be used to demonstrate diagnostic procedures and to illustrate various anomalies of the vertically acting muscles.

COURSE 124

Room 712 Period T-5

MAX CHAMLIN, M.D.
New York

Perimetry: Techniques for Detection of Minimal Defects

Techniques for the detection of minimal defects in visual fields caused by early lesions of visual pathways will be demonstrated. The mounting of test objects on permanent carriers, as well as care of these test objects, will be shown. The choice of test objects and methods of recording various field defects will also be demonstrated. Principles which apply to the tangent screen as well as to the perimeter will be presented, and the interpretation of minimal findings will be explained. Cases in which the use of the perimeter entirely supersedes the tangent screen, as well as the reverse, will be shown.

COURSE 125

Crystal Room Period M-6

PAUL A. CHANDLER, M.D.
Boston

Cataract Surgery: Complications During and After Operation

The principal complication occurring during cataract extraction is loss of vitreous. Steps to avoid loss of vitreous will be discussed. These include preoperative sedation and techniques in anesthesia and akinesia as well as technical aspects of the operation itself. Of the postoperative complications, glaucoma is among the most important. It may be due to vitreous loss, delayed re-formation of the anterior chamber, or incarceration of iris or lens capsule in the wound. Pupillary block is less common, but it is important that this cause be recognized. Emphasis will be placed on measures designed to prevent the complications which lead to glaucoma, and the treatment of glaucoma will be discussed from both the medical and the surgical standpoint.

COURSE 126

Room 781 Period M-4

MORTIMER R. CHOLST, M.D.
Neponsit, Queens, N. Y.

Central Fields: Methods and Techniques

The various methods and techniques presently employed in the mapping of central visual fields will be reviewed, and their respective limitations and advantages will be discussed. This discussion will include the tangent screen and cam-

pimeter, with additional reference to the procedures employed in stereocampimetry.

Recent methods wherein test objects are not utilized, such as those utilizing the Amsler charts and Harrington multiple-pattern screening instrument, will also be demonstrated.

Problems of technique to be reviewed will include a means for rapid determination of the patient's comprehension and ability to maintain satisfactory fixation, so vital to accurate visual fields.

A routine for evaluation of the central field in an eye with reduced corrected vision will be presented.

COURSE 127

Room 726 Period M-4

EDITH COHOE
Detroit
BY INVITATION

Special Reading Instruction for the Partially Seeing

The course will include reading instruction for partially seeing children as a group and as individuals with certain eye conditions, such as cataract and nystagmus. Special materials, aids and devices for making efficient use of low vision will be discussed and demonstrated. The course will be illustrated with colored slides.

COURSE 128

Room 706 Period T-4

EDMOND L. COOPER, M.D.
Detroit

Principles of Muscle Surgery

The aim of muscle surgery is to align the visual axes. In cases in which a functional improvement can be expected, surgery should be considered only a supplement to optical and orthoptic treatment, but alignment must be attained if binocular vision is to be the end result. In cases in which only cosmetic improvement can be expected, alignment is none the less important.

It is the purpose of this course to explain the principles which enable us to obtain the proper alignment of the visual axes. Included among these principles are (1) proper diagnosis, (2) early surgery, (3) influence of prognosis, (4) preoperative planning of how much surgery to do and how this is determined, and (5) technique.

COURSE 129

Crystal Room Period T-4

FREDERICK C. CORDES, M.D.
San Francisco

Surgery of Congenital Cataracts

The various operative procedures being used in the surgery of congenital cataracts will be described, with special emphasis on linear extraction. The indications and contraindications for surgical intervention will be given. In addition, the age of the patient optimal for success of the operation, the choice of operation, and the complications encountered in congenital cataracts will be discussed.

The course will be illustrated by kodachrome slides.

COURSE 130

Room 777 Period M-5

FREDERICK C. CORDES, M.D.
San Francisco

Eye Changes in Diabetes

This course will present the changes that occur in the conjunctiva, cornea, iris, lens, retina and optic nerve as a result of diabetes. In addition, the prognosis, as it bears on the patient's vision following cataract surgery and retinopathy will be discussed at considerable length. The course will be illustrated by kodachrome slides of the ocular conditions and the microscopic changes that occur.

COURSE 131

Room 784 Period M-5

TULLOS O. COSTON, M.D.
Oklahoma City

Inflammatory and Degenerative Disease of the Retina: Differential Diagnosis and Treatment

The subject matter to be covered will include senile macular degeneration, Kuhnt-Junius' degeneration, central angiospastic retinopathy, and the lesions of tuberculosis and toxoplasmosis. The author's method of handling these conditions will be discussed. Colored lantern slides will be shown illustrating the various conditions.

COURSE 132

Room 733 Period Th-4

JACK P. COWEN, M.D.
Chicago

Office Technique for Simplified Gonioscopy

A simple study of the angles of the anterior chamber, particularly in all cases of glaucoma, can be accomplished by a lens-free method of flooding the inner angle of the eye with saline solution and of studying the submerged chamber angle with flashlight illumination and from five to ten power loupe magnification or, better still, with the detached binocular slit lamp head. The method will be demonstrated and discussed.

COURSE 133

Room 715 Period M-5

JOHN C. CUNNINGHAM, M.D.
Burlington, Vt.

Types of Head Pain as Viewed by the Ophthalmologist

The mechanism of head pain will be discussed. The clinical types of headache arising from intracranial, extracranial and paracranial sources will be reviewed. Particular attention will be given to head pain associated with cranial arteritis, migraine and orbital lesions. Lantern slides will be used in the course.

COURSE 134

Room 710 Period W-4 or Th-4

PAUL L. CUSICK, M.D.
Detroit

Ptosis: Differential Diagnosis and Treatment

Blepharoptosis will be classified according to its causation. The various types will be illustrated with lantern slides. The procedures used by the author to correct the various types will be described, and will be illustrated with lantern slides to show the technique.

Overcorrection and its relief will be discussed, and the procedure used for levator recession will be illustrated with lantern slides.

COURSE 135

Room 716 Period M-4 or T-4

NORMAN L. CUTLER, M.D.
Wilmington, Del.

Cataract: Methods of Extraction

Every ophthalmologic surgeon develops, over a period of years, a definite and somewhat fixed operating procedure for cataract based on his accumulated trial-and-error experience. In this procedure he feels most at home and gets his best results. All of these various methods of intracapsular extraction have been studied, simplified, and refined by different surgeons to determine which presents the fewest complications, from the first incision to final test of vision. It is not the purpose of this instruction hour to review the entire field of cataract surgery. There will be a review of the progress in cataract surgery and a discussion of the present-day trends in incision suturing and methods of lens extraction, including the spoon extraction. Lantern slides and a motion picture will be shown.

COURSE 136

Room 784 Period M-6 or T-6

LOUIS DAILY, M.D.
Houston, Texas

Biomicroscopy of Vitreous and Fundus Oculi

Techniques of examination will be described. The normal and pathologic appearance of these structures will be illustrated with sixty colored transparencies made in Vienna under the direction of Dr. Karl Hruby. Types of detachment of the vitreous in association with pathologic states, including spontaneous collapse of the vitreous, hemorrhage into the vitreous, opacities, congenital anomalies, retinitis proliferans, primary and traumatic detachments of the retina, intraocular foreign bodies, tumors and cysts of the choroid, papilledema, retinal cysts, macular edema, chorioretinitis, retinoschisis, and drusen, will be illustrated and described. The clinical significance of these observations will be discussed.

COURSE 137

Room 781 Period M-5

ALAN DAVIDSON, M.D.
New Bern, N. C.

Surgical Instruments: Preparation and Care

This discussion is designed for those ophthalmologists practicing in general hospitals who do not have nurses especially trained to care for ophthalmic surgical instruments. Mention will be made of the manufacture, materials, and choice of surgical instruments as well as their sterilization, preparation and care.

COURSE 138

Room 778 Period M-4

FREDERICK J. DAVIS, M.D.
Madison, Wis.

Sutures in Cataract Surgery: Types and Uses

The use of sutures for closure of the cataract incision has, in the past few years, assumed a role almost equal in importance to the incision itself. While sutures are widely endorsed and their usefulness is generally conceded, the types of needle, suture material, and methods of insertion are still subjects of controversy and vary with different surgeons.

Properly placed sutures afford immediate firm closure of the incision when the lips of the wound are accurately approximated, thereby effecting early restoration of the anterior chamber. They prevent subsequent spreading of the wound, loss of the anterior chamber, and iris prolapse. They permit early ambulation of the patient and occlusion of the operated eye only. The incidence of postoperative hyphema and the amount of astigmatism have been reduced by their use.

This discussion will touch upon the following subjects: types of suture material and their influence on the healing process; types and sizes of needles, with suggestions concerning instruments and their use; and methods of suturing as related to the incision chosen by the surgeon. There will be a discussion of conjunctival and scleroconjunctival sutures, corneal and corneoscleral edge-to-edge or "border-to-border" sutures inserted through the lips of the wound, overriding corneoscleral and episcleral, and track sutures; buried surgical gut; preplaced and postplaced sutures; and suture removal.

COURSE 139

Room 781 Period M-6

ROBERT M. DAY, M.D.
New York

Medical Exophthalmos: Diagnosis and Treatment

The clinical concept of this orbital process, gained from observations in a large thyroid clinic, will be discussed. Terminology, symptoms, signs, course, differential diagnosis and treatment will be presented. The variable clinical picture will be especially emphasized, for the recognition of this condition is most important not only from the point of view of management but also in the evaluation of any form of treatment.

COURSE 140

Room 777 Period M-6 or W-6

ARTHUR G. DeVOE, M.D.
New York

Corneal Dystrophies

This course will deal with the common forms of corneal degeneration associated with the aging process, as well as with the classical hereditary types of true dystrophy. Current ideas on treatment will be emphasized.

COURSE 141

Room 716 Period M-6

SAMUEL M. DISKAN, M.D.
Atlantic City

Visual Screening in Schools

This course will point out the various aspects of visual screening in schools, and stress will be placed on what we must do to keep school vision testing under the supervision of the medical profession, where it belongs. The course will include:

1. The nation-wide problem of school vision testing
2. How to set up a school vision screening program
3. Normal standards of vision for school children
4. Eye tests which lend themselves to mass screening techniques
5. A demonstration of visual screening techniques and equipment.

COURSE 142

Room 777 Period T-4 or Th-4

JOSEPH M. DIXON, M.D.
Birmingham, Ala.

Indirect Ophthalmoscopy in Office Routine and in Intraocular Surgery

Many fundi and fundus lesions can be seen better by indirect ophthalmoscopy than by the direct method. Routine office technique and an outline for the development of skill will be described. An efficient office arrangement which gives the ophthalmologist a choice of direct or indirect ophthalmoscopy, as indicated for each patient, will be illustrated. Advantages and limitations of the two methods of ophthalmoscopy will be compared for the office, for the bedside, and for the operating room. A brief review of the early development of the indirect method will be presented with illustrations of various types of monocular and binocular equipment.

COURSE 143

Room 726 Period M-6 or T-6

EDWARD A. DUNLAP, M.D.
New York

Divergence Anomalies

These anomalies consist of divergence excess and divergence insufficiency. Both are characterized by certain specific findings that serve clearly to differentiate them from anomalies of convergence. Their location in the general classification of imbalances and statistics on their relative occurrence will be given.

Symptoms of each type will be listed, and the method of diagnosis will be discussed. Typical case measurements and pictures of each type will be shown.

Treatment, both conservative and surgical, will be outlined, and tabulated results of studies on over one hundred surgically treated cases of divergence excess will be presented.

COURSE 144

Room 777 Period W-4

JOHN A. EGAN, M.D.
Denver

Cross Cylinder: Application and Theory

The use of the cross cylinder as taught by Edward Jackson will be discussed. Improved models will be shown and uses devised since Jackson's time will be described.

Lantern slides will exhibit practical application of the cross cylinder. Large 2-foot models of cross cylinder, trial cylinder and trial frame will be used to demonstrate general technique for use in refraction. Twelve different uses of the instrument, including the employment of the newer correcting cross cylinder, will be described.

A brief discussion of theories involved in the cross-cylinder method will be presented, and controversial aspects will be discussed. This method of testing for astigmatism will be contrasted with other methods.

COURSE 145

Room 777 Period T-5

HAROLD F. FALLS, M.D.
Ann Arbor, Mich.

Practical Application of Heredity

The purpose of this course is to present the principles of heredity so that they may be employed by the clinical ophthalmologist in his daily practice. When possible, diseases having hereditary background will be illustrated and discussed. A demonstration of pedigree taking and interpretation will be presented.

COURSE 146

Room 777 Period W-5

HAROLD F. FALLS, M.D.
Ann Arbor, Mich.

Ocular Geriatrics

A comprehensive survey of the ocular changes and disease states associated with senescence will be presented. When possible, a differentiation will be made between universally occurring disease states in the aged eye and those disease processes appearing in senescence but having no direct relationship to the passage of time.

Treatment, care, and management of the senile eye and individual will receive consideration.

COURSE 147

Room 740 Period M-6

OLGA FERRER, M.D.

Vedado, Havana, Cuba

Contact Lenses

Practical application of contact lenses in surgery, as a diagnostic aid, and in the correction of optical defects will be presented. Attention will be given to problems arising in office practice regarding the indication for contact lenses, selection of type of lens, and fitting techniques.

COURSE 148

Room 706 Period T-6 or W-6

WALTER H. FINK, M.D.
Minneapolis

Binocular Problems in Routine Refraction

Although the correct selection of lenses solves most of the refractive problems, there remains an appreciable number of cases in which a binocular problem is present to some degree. Because of this, a routine study of the binocular efficiency of all refraction cases is indicated. Although some require a minimum of study, others require an extensive analysis of the binocular function for proper evaluation.

In the presentation, the steps in the investigation of binocular efficiency as carried out in routine refraction are evaluated and the various problems encountered are discussed, particularly the association between heterophoria and the fusional reflexes.

COURSE 149

Room 711 Period T-4

F. BRUCE FRALICK, M.D.
Ann Arbor, Mich.

Surgical Anatomy in Operations for Glaucoma

It is essential that every ophthalmic surgeon have an understanding of the anatomy of the eye. Familiarity with normal relationships gives confidence when corrective operations are undertaken in complicated cases. A knowledge of anatomy includes an understanding of the variations from the normal and the effect these variations have in the functioning of the part. The surgical aspects of glaucoma therapy, therefore, require that the operator possess sufficient ocular anatomic insight to permit him to establish adequate drainage of aqueous to compensate for the known pathologic changes which have disturbed the normal physiology of aqueous exchange.

COURSE 150

Room 743 Period T-4

BERNARD FREAD, M.D.
New York

Ideal Refraction Equipment: Survey of Instruments Used

Refraction is most important in the daily routine of every ophthalmologist. A good part of each working day is spent with details of refraction and not enough emphasis has been placed upon the tools necessary to make refraction easier, more accurate, and less time-consuming.

Every major refraction instrument manufactured in the United States and in the larger optical plants of England, France, Germany, Italy, Japan and Switzerland will be discussed. About two hundred lantern slides will graphically illustrate this equipment.

Attention will be given not only to elementary equipment used by the beginner but also to elaborate devices used for the objective and subjective measurement of refraction of particular interest to the experienced ophthalmologist.

The name, function, manufacturer, and current cost of the various instruments will be reported.

COURSE 151

Room 706 Period T-5

WILFRED E. FRY, M.D.
Philadelphia

Inflammatory and Degenerative Lesions at the Posterior Pole of the Eye: Differential Diagnosis

Not only must a differential diagnosis be made between inflammatory and degenerative lesions at the posterior pole of the eye but these conditions must also be distinguished from malignant lesions. The factors governing diagnosis of malignant lesions at the posterior pole of the eye will differ from those governing diagnosis of lesions in the midzone or in the anterior segment. When the lesion is in the midzone or the anterior segment, distinction must be made between a serous and a solid detachment. When the lesions are in the posterior segment the diagnosis must be made upon the ophthalmoscopic appearance plus all other information that can be afforded by a complete examination of the patient.

The situation is different when the macula alone is involved, or when the region of the disc is involved.

Types of lesions as they involve the macula and the perioptic region will be illustrated and the management discussed.

COURSE 152

Room 716 Period M-6

SHELLEY R. GAINES, M.D.
New Orleans

Ophthalmologic Examination from a Neuro-ophthalmologic Viewpoint

In this course, a routine for performing the ophthalmologic portion of a neuro-ophthalmological examination with a minimum of equipment and conservation of time will be presented. It is useful with both office patients and those seen in consultation at a hospital.

COURSE 153

Room 715 Period T-4

SAMUEL GARTNER, M.D.
New York

Fundus Diseases: Clinical and Pathologic Correlations

The fundus pictures in many diseases will be correlated with the clinical course of the disease and essential pathologic findings. Numerous photomicrographs of eyes obtained at autopsy will be demonstrated. The vascular diseases, the blood dyscrasias, diabetes, and a number of neurologic disorders, including papilledema, optic neuritis, multiple sclerosis and the chiasmal syndrome, will be studied.

COURSE 154

Room 786 Period M-5

J. CONRAD GEMEROY, M.D.
Detroit

External Diseases

This lecture on external eye diseases, their diagnosis and treatment, is illustrated with kodachrome slides to show the usual, as well as some unusual, diseases of the lids, conjunctiva, and cornea. These illustrations will be projected stereoscopically in color on the screen.

COURSE 155

Room 716 Period T-5

GLEN G. GIBSON, M.D.
Philadelphia

Retinopathy: Differential Diagnosis

This course will comprise a discussion of the significant ophthalmoscopic signs by means of which the common diseases which produce retinopathy can be identified and evaluated. The clinical significance of the various forms of retinopathy will be outlined in a practical manner and will be illustrated by fundus photographs, in an effort to make our consultations with the practicing physician more meaningful.

COURSE 156

Room 777 Period M-4

HAROLD GIFFORD, M.D.
Omaha

Local Anesthesia with Special Reference to Deep Motor Block

The anatomy of the orbit with reference to the nerves and blood vessels will be reviewed in detail. The course will include a discussion of the methods for producing complete anesthesia as well as complete motor block of the extraocular muscles. The technique will be described and illustrated with slides and motion pictures. This technique produces a long-lasting anesthesia. The intraocular pressure is reduced. The chamber is deepened. If the motor block is complete, there is no pressure on the globe from the intraocular muscles.

These factors all tend to prevent vitreous loss in cataract surgery, and they have proved valuable in glaucoma, strabismus, and retinal operations.

COURSE 157

Room 784 Period T-5 or W-5

JOHN F. GIPNER, M.D.
Rochester, N. Y.

Recent Advances in Ophthalmology

This course will present (1) a review of the advances in the surgical handling of congenital cataracts; (2) newer techniques in glaucoma surgery; (3) a resume of the lecturer's preferred intracapsular cataract extraction technique; and (4) as much of other newer surgical techniques as time allows.

COURSE 158

Room 781 Period T-4

MILLARD E. GUMP, M.D.
Oakland, Calif.

Recurrent Iridocyclitis: Differential Diagnosis and Treatment

The nearly universal use of the corticosteroids in treating iridocyclitis is lulling our medical conscience to sleep. These drugs block inflammation so well that they foster an attitude of less diligence in the attempt to establish a specific diagnosis and to seek out and eliminate etiologic factors.

A review of the differential diagnosis of iridocyclitis will be made. A routine of investigation used at a county hospital, a veterans' hospital and a Naval hospital will be discussed and evaluated.

Treatment with special reference to the corticosteroids and foreign protein will be considered.

COURSE 159

Room 711 Period W-4 or Th-4

JOSEPH S. HAAS, M.D.
Chicago

Congenital Glaucoma: Diagnosis and Treatment

Corneal cloudiness, injection of the bulbar conjunctiva, increased lacrimation, or blepharospasm should lead to the suspicion of glaucoma even though no enlargement of the eye has occurred. In view of the urgency of early operation, the tension should be tested with a tonometer under ether anesthesia, preferably intratracheal. There should be complete relaxation at the moment the tension is taken. Once the diagnosis is established, 5 per cent prostigmine should be instilled every three hours and goniotomy performed as soon as possible. Denuding the cloudy epithelium of the cornea makes the operation under gonioscopic control possible in over 90 per cent of cases. The present simplified technique of goniotomy is described.

COURSE 160

Room 781 Period T-5

GEORGE M. HAIK, M.D.
New Orleans

The Mechanics of Intracapsular Cataract Extraction

The primary objective of cataract surgery is to deliver the lens by a technique which is at the same time simple and safe, and which is attended with a minimum of postoperative complications. In spite of the numerous improvements which have been introduced, a technique which meets all of these criteria has not yet been found. On the contrary, all of the techniques now employed are sometimes associated with serious hazards and may be followed by serious complications.

For many years intracapsular extraction has been the preferred technique of cataract surgery. One reason, perhaps, that it is not yet as satisfactory as it might be is that too little attention has been paid to the preliminary steps of releasing the lens from its attachments and its subsequent subluxation. When these steps have been accomplished properly, without rupture of the lens capsule, the remaining steps of the operation are usually relatively easy.

COURSE 161

Room 706 Period M-6

HAROLD A. HANNO, M.D.
Philadelphia
BY INVITATION

Internal Medicine: Problems Pertinent to Ophthalmology

The following topics will be included in the discussion:

1. Indications and contraindications for typhoid fever therapy, ACTH and adrenocortical steroids
2. The prevention and treatment of postoperative medical complications in eye surgery
3. Management of the "cougher" in eye surgery
4. Local versus general anesthesia in eye surgery
5. Anticoagulant therapy in retinal vascular occlusions

A number of interesting cases of ophthalmologic disorders secondary to systemic disease will be presented. These will be illustrated by colored slides.

COURSE 162

Room 781 Period W-4 or Th-4

ROBISON D. HARLEY, M.D.
Atlantic City

Lesions of the Third, Fourth and Sixth Cranial Nerves: Topical Diagnosis

Topical diagnosis of lesions of the third, fourth, and sixth cranial nerves requires a systematic consideration of the orbit, cavernous sinus, base of the brain, brain stem, nucleus, and supranuclear connections. This course in the differential diagnosis of various motor anomalies of the eye and the associated signs is designed especially for the prac-

ticing ophthalmologist. Anatomy will be reviewed in describing various syndromes as they occur in this clinical approach to the subject. Short case histories will be utilized for illustration of important signs and symptoms.

COURSE 163

Room 750 Period M-6

DAVID O. HARRINGTON, M.D.
San Francisco

Dynamics of Phacoerysis

The dynamics of intracapsular lens extraction by the suction method will be demonstrated. Slides and slow-motion pictures will illustrate the manner in which the suction cup of the erysiphake acts upon the lens capsule and zonular lamella. Special attention will be directed to (1) capsular traction; (2) capsular distortion at the equators; (3) transmission of capsular stress to the zonule; (4) zonular stripping; (5) variations in technique of extraction based upon the type of cataract and knowledge of the dynamics involved; (6) degree of vacuum and technique of manipulation of lens in both sliding and tumbling procedures; (7) complications encountered in phacoerysis; and (8) special application and uses of the suction method.

COURSE 164

Room 793 Period Th-4

WILLIAM H. HAVENER, M.D.
Columbus, Ohio

Ocular Melanoma

Through what characteristics may malignant melanoma of the uveal tract be identified? What conditions simulate malignant melanoma, and by what criteria can they be differentiated? External, fundus, and appropriate histologic pictures will be used to illustrate such points as retinal elevation, detachment, inflammation, pigmentation, surface manifestations, and hemorrhage.

COURSE 165

Room 743 Period T-5

THOMAS R. HEDGES, JR., M.D.
Philadelphia

Neuralgias of the Head: Treatment

This subject is important in the daily practice of ophthalmologists and otolaryngologists alike. It concerns the proper evaluation and classification of head pain, with particular reference to therapy. A clear outline of the differential diagnosis not only includes the neuralgias of the face, both typical (tic douloureux) and atypical, but also covers migraine headache and its equivalents, other vascular headaches, and head pain from other causes. The latter include headache associated with temporal arteritis, brain tumors, and aneurysms. Modern methods of diagnosis and treatment of these disorders will be considered in some detail.

COURSE 166

Room 750 Period W-4
or or
Room 752 Period Th-4

JOHN W. HENDERSON, M.D.
Ann Arbor, Mich.

Chiasmal Area Lesions

A review of the various pathologic entities which affect the optic chiasm, together with the correlation of clinical symptoms, findings, and visual fields, will be presented. Actual case histories will be employed, together with the visual field records of the patients involved.

COURSE 167

Room 743 Period T-6

HOWARD F. HILL, M.D.
Waterville, Maine

Cataract Surgery:
Keratome and Scissors Technique

Incision and closure of the cataract wound will be discussed, with special reference to certain advantages in using

the keratome and scissors. Emphasis will be placed upon many small details that are occasionally overlooked, each one of which is important in perfecting this technique.

Special instruments and their proper use will be described. Wound closure will be emphasized, and a new suture technique that takes advantage of the stiffness of surgical-gut suture material which is especially adapted to this method will be described. Motion pictures and diagrams will be used to illustrate the technique.

COURSE 168

Room 786 Period M-4

MICHAEL J. HOGAN, M.D.
San Francisco

Lesions of the Choroid: Their Pathologic Significance

A correlation will be made of the clinical aspects of various diseases of the choroid with the pathologic findings in these same diseases. The discussion will include the following topics: hypertension, choroidal vascular disease, arteriosclerotic disease, senile macular degeneration, disciform degeneration, angioid streaks, drusen, and benign and malignant melanomas.

COURSE 169

Room 796 Period W-6

CHARLES E. ILIFF, M.D.
Baltimore

Ptosis

The surgical anatomy of the lids, on which all ptosis surgery is based, will be discussed in detail and illustrated with slides.

The various types of ptosis, such as congenital, senile, traumatic, and jaw winking, will be discussed. Operations using the frontalis, the superior rectus, and levator muscles will be reviewed, with particular stress on the indication and use of each procedure.

A simplified ptosis operation which shortens the levator and Muller's muscle, thus increasing the primary elevating force to the lid, and which enhances the secondary elevating action of the superior rectus and frontalis, will be demonstrated by a motion picture.

COURSE 170

Room 778 Period M-6

JERRY H. JACOBSON, M.D.
New York

Electroretinography

The change in the electrical status of the retina when it is functioning can be detected and recorded by the relatively simple technique of electroretinography. The test has been shown to be of value in the early diagnosis of retinal degenerations, in retinal detachment, and in evaluation of the status of a retina obscured from ophthalmoscopic view by cataract or vitreous or corneal opacity.

This course will include a description of the technique of the test, with emphasis on the facility with which it can be performed in almost any hospital, and a discussion of present and future applications. A motion picture will illustrate the actual technique. The related electrophysiological technique of electromyography will also be discussed.

COURSE 171

Room 777 Period T-6

ARTHUR J. JAMPOLSKY, M.D.
San Francisco

Ocular Divergence: Management

Anomalies of divergence follow a general pattern of exophoria, intermittent exotropia at distance, intermittent exotropia at distance and near, and constant exotropia. The importance of supression, both axial and hemiretinal, is paramount in proper surgical or orthoptic management. The prognosis and methods of treatment (optical, orthoptic, and surgical) differ markedly in exophoria, intermittent exotropia, and constant exotropia. The function of fusional diver-

gence is to be differentiated from the passive and active factors producing intermittent and constant exotropia. The sensory and motor mechanisms in divergence anomalies differ in visually young and visually adult patients, and the management should be modified accordingly.

COURSE 172

Room 778 Period T-5

FRITZ JARDON
Detroit
BY INVITATION

Fitting Ocular Prostheses

The entire field of prosthesis-fitting, following various surgical procedures, will be discussed. Subjects of interest will include enucleation, evisceration, Tenon's capsule implants, integrated implants, secondary implantation and socket restoration.

Use of pressure conformers in correcting abnormalities in sockets and in enlarging sockets and lids in children born without an eye, the preparation for well-functioning prostheses, and methods which give best cosmetic end results will be discussed.

Taking molds of sockets for cover lenses and eyes will be explained, as movement is often greatly improved when the prosthesis is made over a mold.

Color slides will be shown.

COURSE 173

Room 716 Period T-6

FRED JOBE
Rochester, N. Y.
BY INVITATION

Practical Optics

This course will deal with basic ophthalmic optics, explaining in nonmathematical terms how and why lenses and prisms perform. Demonstration will be used to illustrate optical principles such as the interval of Sturm and errors of refraction. This information will be used as the groundwork to explain the optical correction of errors of refraction with spectacle lenses, as well as to interpret the optical performance of ophthalmic instruments. Various forms of single-vision and multifocal lenses will be discussed and evaluated.

COURSE 174

Room 716 Period W-5

CARL C. JOHNSON, M.D.
Boston

Ptosis

This course is concerned with a classification of the various types of ptosis, with particular reference to congenital ptosis. The part played by associated anomalies, the amount of levator function, and the presence of binocular vision will be stressed.

With this classification as a basis, indications for various types of operative procedure will be considered. Particular attention will be paid to levator resection as done through a skin incision. The course will be illustrated by slides and a motion picture.

COURSE 175

Room 786 Period T-5

LESTER T. JONES, M.D.
Portland, Ore.

The Lacrimal Drainage System: Complicated Conditions

Recent dissection studies will be used to clarify the surgical anatomy of the medial canthus and to introduce two new anatomic concepts: (1) the lacrimal diaphragm and (2) the lacrimal pump.

Consideration will be given to surgical procedures for the cure of epiphora when conventional tear-sac surgery has failed and in conditions in which parts of the lacrimal drainage apparatus are missing. The following procedures are advocated:

1. Slitting the canaliculus: the proper indications
2. Canaliculodacryocystostomy
3. Canaliculorhinostomy
4. Conjunctivodacryocystostomy
5. Conjunctivorhinostomy

Surgical care of acute injuries of the lacrimal apparatus will be discussed, and a method will be presented for reopening a closed intranasal tear-sac ostium.

COURSE 176

Room 781 Period T-6

HAROLD H. JOY, M.D.
Syracuse, N. Y.

Role of Cerebral Angiography in Ophthalmology

The presence of an unexplained visual defect should always suggest the possibility of an intracranial lesion. Since not only vision but life itself may be at stake, early diagnosis is essential. In such cases angiography will frequently demonstrate the location and the character of the lesion sooner than any other measure.

The object of this course is to familiarize ophthalmologists with this important diagnostic procedure. After a review of the normal anatomy of the arteries and visual pathways at the base of the brain, the principles of angiography as related to ophthalmology will be discussed. This will be followed by the projection of angiograms accompanied by case reports demonstrating the diagnosis of intracranial lesions affecting the chiasm and optic nerves.

COURSE 177

Room 740 Period Th-4

KELVIN A. KASPER, M.D.
Philadelphia

Dacryocystorhinostomy

Following the classical Mosher-Toti technique, with some variation, an attempt will be made to demonstrate the simplicity and safety of this combined external and intranasal operation on the lacrimal sac in a bloodless field, with all structures outlined and easily identified under direct vision. The regional anatomy, the various structures encountered, and the limits of safety during the operation will all be demonstrated. Preoperative preparation, exact technique of local anesthesia, and postoperative care will also be outlined.

Fresh cadaver material will be used to clarify the various operative steps, and a motion picture will be shown.

COURSE 178

Room 778 Period M-5

DEWEY KATZ, M.D.
Hartford, Conn.

Ophthalmic Anatomy: Clinical Significance and Application of Recent Advances

In this course there will be a discussion of the clinical applications of the recent advances in our knowledge of the anatomy and histology of the eyeball. Among the topics which will be discussed are the clinical import of our present ability to outline and measure the eyeball in situ, especially as it pertains to refractive states and intraocular foreign bodies; the aqueous veins and their probable clinical significance; and new information regarding the vitreous body and the retina. There will also be some discussion of lesser known anatomical structures and the clinical implications of their recognition.

COURSE 179

Room 750 Period T-4

ROSCOE J. KENNEDY, M.D.
Cleveland

Practical Perimetry

This course will cover the important aspects of perimetry, including technique, anatomy of visual pathway, interpretation of visual field defects, and the clinical evaluation of visual fields in everyday practice. The value of colored test objects will be discussed. Reports of cases that exemplify (1) field defects characteristic of lesions involving the visual pathway and (2) field defects indicative of glaucoma will be presented and discussed.

COURSE 180

Room 778 Period T-6 or W-6

ALFRED KESTENBAUM, M.D.
New York

Reading Aids for Low Vision

Four reading devices are available for low vision: magnifying eyeglasses, loupe, telescopic loupe, and magnifying projection. Practical rules by which the required strength of these devices can be calculated from an individual's visual acuity will be discussed.

For very low vision (20/300 to finger counting at four feet) the magnifying eyeglass is available. The advantages and disadvantages of elimination of spheric aberration by using a small lens (original microglasses), by two air-separated lenses (microscopic lenses), by a combination of several lenses, and by lenses with aspheric curvature will be discussed and results from the use of each of these aids reported. If the strength of the device prescribed has been properly calculated from available formulas, patients with vision as low as finger counting at four feet are almost invariably able to read usual print unless they have some psychological handicap, such as unwillingness to read. In some instances the vision attained deviates from the calculated improvement because of the nature of the disease. These deviations will be discussed.

A plan will be developed to aid in establishing further clinics for patients with low vision.

COURSE 181

Room 786 Period T-6

JOHN E. L. KEYES, M.D.
Cleveland

Retinal Vascular Disease: Ophthalmoscopic Studies

Ophthalmologists are expected to evaluate intraocular disease. Many of these diseases have a definite prognostic bearing on the visual acuity and on the life expectancy of a patient.

Much can be done to alleviate disease of the retinal vascular system. Recognition of the earliest evidence of disease of the retinal blood vessels makes a more favorable prognosis possible. Even well established disease of the retinal arterioles with retinopathy can occasionally be reversed.

Pertinent case reports will be presented and illustrated by lantern slides in color.

COURSE 182

Room 713 Period M-6

SAMUEL J. KIMURA, M.D.
Berkeley, Calif.

Low-grade Chronic Inflammatory Lesions of the Anterior Segment of the Eye

This course will cover the more common chronic inflammations of the lids, conjunctiva, cornea, and the anterior uveal tract. Diagnosis and treatment will be stressed. Kodachrome slides will be used to illustrate the clinical conditions.

COURSE 183

Room 732 Period W-5 or Th-5

BERTHA A. KLIEN, M.D.
Chicago

Clinical Pathology of the Retina

The clinical manifestations of a diseased retina and pigment epithelium, and the pathogenesis of retinal disease in general will be discussed prior to a demonstration of the specific findings in a selected group of such diseases. Special emphasis will be placed upon the diagnosis of functional, inflammatory, and degenerative lesions of the macula lutea and on their differential diagnosis with relation to melanotic tumor, where this question arises.

COURSE 184

Room 715 Period T-6

ABRAHAM L. KORNZWEIG, M.D.
New York

Practical Embryology

A study of the embryology of the eye has many practical values for the ophthalmologist. It enables him to under-

stand the structure of the eyeball by seeing how it developed. This helps him to appreciate the functioning of the different parts of the globe. Above all, it aids in the differentiation of defects in the eye due to developmental and hereditary causes from those due to environmental conditions.

A series of slides will be shown demonstrating critical periods in the development of the human eye. Special attention will be given to abnormalities of the eye; congenital cataracts; congenital hydrophthalmos; typical colobomas of the iris, choroid, ciliary body and optic nerve; aniridia; microphthalmia; abnormalities of the optic disc; congenital defects in the retina; and retrolental fibroplasia.

COURSE 185

Room 710 or Room 702 — Period W-5 or Period Th-4

BERNARD KRONENBERG, M.D.
New York

Practical Ocular Therapeutics

This course will present therapeutic measures for the most common and frequent ocular problems. Diseases of the cornea, uvea, vitreous and retina will be discussed. The course will also delineate the limitations of our knowledge in the therapy of some of the baffling diseases. An attempt will be made to keep the discussion on a practical level.

COURSE 186

Crystal Room — Period W-4

PETER C. KRONFELD, M.D.
Chicago

The Choice of the Surgical Procedure in Glaucoma

There exist now in the ophthalmic literature very considerable data on the results of the various glaucoma operations in the various types of glaucoma. In some respects these data are conclusive in that they point out, for given situations, a definite superiority of one surgical procedure over another. The data also show a strong personal factor in the sense that the surgeon's skill and familiarity with the operation influences its result. The latter factor is more clearly discernible in trephinings than in iris-inclusion operations or cyclodialyses.

COURSE 187

Room 711 — Period T-6

BRENDAN D. LEAHEY, M.D.
Lowell, Mass.

Corneal Transplantation

Practical points in preparatory surgery and therapy, operative techniques, and complications will be stressed, with special emphasis on current trends in graft fixation. Various types of overlying and direct sutures and splints will be shown along with several recently designed instruments. The newest version of the author's preplaced track suture method will be included. With this technique, silk sutures are inserted, running 1 mm. on each side of the trephine mark. These are stained with methylene blue and pulled through, leaving blue tracks for the subsequent direct sutures. Corresponding preplaced sutures are inserted in the graft with the aid of a plastic turret-style holder. For grafts up to 6 mm. in diameter, overlying sutures are also utilized.

The lecture will be illustrated by a series of eighty-five slides and a short motion picture, with sound, of one operation.

COURSE 188

Room 712 — Period T-4 or W-4

PLACIDUS J. LEINFELDER, M.D.
Iowa City, Iowa

Perimetry and Use of the Tangent Screen

The practicability of the two methods of examination will be considered in relation to their value in diagnostic and follow-up examinations. Sufficient discussion of the theory will be included to enable the student to understand the rea-

sons for preference of one method over the other. Definition of the precise requirements for field taking will be stressed.

COURSE 189

Room 715 Period W-5

ALBERT N. LEMOINE, JR., M.D.
Kansas City, Mo.

Vitreous Opacities

The anatomy and embryology of the vitreous will be briefly reviewed. The physical and chemical properties found in the normal and pathologic vitreous will be summarized.

Specific types of vitreous opacities to be considered are congenital remnants of the embryonic vascular system, protein coagula, synchysis scintillans, asteroid hyalitis, inflammatory exudates, blood, and retinitis proliferans.

Therapeutic measures will be discussed.

COURSE 190

Room 702 Period W-6

ROBERT W. LENNON, M.D.
Joliet, Ill.

Therapy of Acute Inflammatory Glaucoma

The therapy of acute inflammatory glaucoma will be divided into medical and surgical categories. Medical treatment will be discussed from the standpoint of local and oral medication. Special reference to the pharmacologic and physiologic actions of all the drugs employed in acute glaucoma will be made. Parasympathomimetic and sympathomimetic agents will be reviewed. Miotics will be classified and their physiologic action on the pupil described. A review of Diamox will be given, and this drug's role in the treatment will be explained.

Surgery of acute inflammatory glaucoma will be discussed with special reference to the types of surgery as well as to the timing of the procedures.

The lecture will be supplemented by the use of colored slides to explain the therapy discussed.

COURSE 191

Crystal Room Period W-5

IRVING H. LEOPOLD, M.D.
Philadelphia

Advances in Ophthalmic Therapy

Each year new drugs are discovered. Not all of these go beyond the clinical-evaluation or even the laboratory-testing stage. Some survive and assume a place in clinical diagnosis or therapy.

Increasing experience with established drugs provides additional information, with which a better evaluation of side effects, toxicity, and benefit can be made. Many agents are employed for which the mechanism of action is not shown. Accumulated data often suggest, if they do not prove, the more likely mechanism.

The influence of the past few years on ophthalmic therapy with autonomic drugs, anticoagulants, enzymes, enzyme inhibitors, chemotherapeutic and antibiotic agents, tranquilizers, antihypertensives, anesthetics, diuretics, and other categories will be analyzed.

COURSE 192

Room 726 Period W-4 or Th-4

CECIL W. LEPARD, M.D.
Detroit

Eye Diseases Common to Children

Those ocular diseases occurring primarily in children constitute a group of special interest to the ophthalmologist, particularly when the method of examination or the differential diagnosis differs from that for those diseases in the adult. The technique and results of examination of premature infants will be discussed. The following syndromes will be discussed: neuroblastoma, chloroma, Schuller-Christian's disease, and eosinophilic granuloma. The discussion will be illustrated by lantern slides showing photomicrographs and findings in the eye and orbit.

COURSE 193

Room 715 Period T-5

IRVIN LEVY, M.D.
Trenton, N. J.

Motion Picture Photography in Ophthalmology: Methods and Highlights

In this course we will start with a brief discussion of general motion picture photographic technique. There will be a detailed discussion of ophthalmologic photography, including examples of recommended types of equipment such as cameras, lenses, lights and other accessories. Specific details of photographic technique will be given, with an attempt to simplify and standardize ocular photography. Good and bad examples will be shown and discussed. The technique of sound as an accessory to photography will be briefly demonstrated.

COURSE 194

Room 713 Period T-6 or W-6

PHILIP M. LEWIS, M.D.
Memphis

External Diseases

This course will consist of a clinic based on about 200 kodachrome slides showing diseases of the lids, conjunctiva and cornea. Several new slides are added each year. The differential diagnosis and the methods of treatment, both medical and surgical, will be discussed.

COURSE 195

Room 784 Period W-4 or Th-4

ARTHUR LINKSZ, M.D.
New York
EDWIN F. TAIT, M.D.
Norristown, Pa.

Telescopic and Magnifying Lenses for the Visually Handicapped

"Telescopic spectacles" are comprised of small Galilean telescopes specially designed for improvement of distance vision in cases of low visual acuity, and for improvement of near vision when reading cups are attached. Their usefulness is limited.

Near vision aids for the patient with only partial sight are of much greater significance. Two such groups of aids are (1) hand magnifiers and loupes, and (2) strong plus lenses and strong reading additions. Commercially available types of these aids will be discussed, and some simple rules of thumb for determining the proper strength to be worn will be given.

COURSE 196

Room 786 Period Th-4

JAY G. LINN, JR., M.D.
Pittsburgh

Choice of Glaucoma Operation

The surgical treatment of glaucoma is indicated for many patients in spite of our recent advances in medical therapy. There are numerous cases which still cannot be controlled medically. In others, surgery is the treatment of choice because anatomic or etiologic factors are present which are known to be the cause of the glaucoma and which can be corrected by surgery.

The course will include consideration of the complete examination of the patient to discover all factors relative to the glaucoma. The mode of action for the various basic types of glaucoma operations will then be discussed. The operation selected in individual cases should be the one most likely to correct those abnormalities responsible for the increased intraocular pressure.

Each type of glaucoma will be discussed and the operation most effective in controlling the tension considered, with the reasons for its greater chance of success.

COURSE 197

Room 793 Period M-5

RALPH I. LLOYD, M.D.
Brooklyn

Fundus Lesions of the Senile Eye

Time takes its toll of the elastic tissues, and these elements of the chorio-

capillaris and the lamina of Bruch in the macular area are particularly vulnerable. The lamina of Bruch is believed to control the passage through the choriocapillaris of nourishment to, and of waste products from, the percipient layers of the retina. The common effects of age are first seen as sclerosis of the vessels of the choriocapillaris, with atrophy of the pigment. This may reach an advanced stage with but little effect upon the vision. "Hole in the macula" is often a feature of this process. In more advanced stages, exudates or hemorrhages may strip up the pigment layer and appear as pseudotumors, finally resulting in either Coats's disease or disciform degeneration.

Differential diagnosis between pseudotumor, metastasis, sarcoma of the choroid, angiospastic retinopathy and organized exudates after injury will be discussed, and the modest results of therapy detailed. Serial kodachrome slides of the various lesions and microslides of the pathologic changes encountered will be correlated.

COURSE 198

Room 781 Period W-5

RALPH I. LLOYD, M.D.
Brooklyn

Diseases of the Cornea

The period will be devoted to a discussion of the diagnosis and treatment of various acquired and hereditary lesions, with special attention to recurrent intractable ulcers following posterior endothelial dystrophy and dendritic keratitis.

Transplants and lamellar keratectomies have been so successful in cases formerly considered hopeless that our prognoses and treatment must be adjusted to conform.

COURSE 199

Room 715 Period M-6

JOHN CHENAULT LONG, M.D.
Denver

Retinoblastoma and the Pseudoretinoblastomas: Differential Diagnosis

In this course not only will the differential diagnosis between retinoblastoma and other confusing entities be discussed but the value of a very complete eye examination will be stressed. This complete examination is of value not only because with it one is more apt to make the correct diagnosis but also because it will protect one in case of a professional liability suit.

COURSE 200

Room 778 Period W-5

VIRGINIA LUBKIN, M.D.
New York

Psychosomatic Aspects of Ophthalmology

Analysis of the highly significant role of psychogenic factors in ophthalmology. Presentation of typical case material illustrative of problems which arise in daily practice. A review of contemporary experimental research in this important area.

COURSE 201

Room 726 Period W-5

CYRIL M. LUCE, M.D.
Camden, N. J.

Wound Healing

Of the various ocular wounds, the one of major interest to the average ophthalmologist is that following cataract extraction. Since the integrity of the wound represents an important factor in the avoidance of early and late complications, it is of interest to study both the normal and abnormal healing of cataract incisions. The healing of wounds, both with and without sutures, and the use of permanent and absorbable sutures will be discussed.

Mention will be made of the healing of the wound following lamellar scleral resection, of conjunctival wounds in various muscle procedures, and of the flap in several glaucoma operations.

COURSE 202

Room 796 Period M-6

ANGUS L. MacLEAN, M.D.
Baltimore

Surgical Management of Cataracts

This subject will be considered with respect to preliminary examination, preoperative preparation, the operation, and

postoperative care. The general preliminary examination, including necessary specific tests, and the detailed local examination of the eye will be outlined. Preoperative preparation, including both general and local procedures, will be discussed. Significant points in the operative technique will be considered, including the use of the conjunctival flap as opposed to no flap and the choice of techniques for the extraction of the lens. Postoperative care, from the procedures immediately following the operation to the final refraction and fitting with glasses, will be comprehensively discussed.

There will be a motion picture demonstration.

COURSE 203

Room 716 Period W-4 or Th-4

JOHN P. MACNIE, M.D.
New York

Head Trauma with Ocular Symptoms

Ocular symptoms and signs associated with trauma to the head will be considered. The mechanisms whereby head injuries may lead to ocular changes will be outlined, and the effect upon the eye of involvement of the various cranial nerves and portions of the brain will be analyzed. The ocular effects of intracranial hemorrhage and injuries in the region of the cavernous sinus will be discussed, and the ocular evidence of skull fracture will be considered.

COURSE 204

Room 786 Period W-4

AUREL E. MANGOLD
New York
BY INVITATION

Proper Fitting of Glasses

This discussion will stress the following subjects:

1. The necessity of analyzing the prescription so that the finished glasses will give maximum comfort and efficiency
2. Anisometropic and unusual prescriptions and their effects on visual comfort
3. The importance of individual pupillary distance measurements
4. Lens form and its effect on visual comfort
5. The importance of vertex distance
6. The proper selection of bifocals in cases of hyperopia and myopia
7. Colored lenses
8. All types of telescopic and microscopic systems
9. Methods of determining causes of patients' complaints with finished glasses
10. Suggested procedure for examination of a pair of glasses

COURSE 205

Room 713 Period W-5

MORTIMER MANN, M.D.
Indianapolis

Hypertensive Vascular Changes in the Fundus

The proper interpretation of the changes produced in the fundus as a result of arterial hypertension depends on their correlation with other clinical and laboratory data. The various ophthalmoscopic findings in essential hypertension, malignant hypertension, toxemia of pregnancy, and acute and chronic nephritis will be presented and discussed in relationship to other manifestations of these diseases. The extent to which observations of the fundi are helpful in prognosis and treatment will also be considered.

COURSE 206

Room 778 Period Th-5

WILLIAM A. MANN, M.D.
Chicago

Functional Visual Impairment

Determination of functional loss of vision after elimination of all organic bases. Differential diagnosis of malinger-

ing and hysteria, with practical tests to be employed. Correct evaluation of importance in compensation cases. Occurrence of functional visual disturbance in nonindustrial and nonmilitary private practice: recognition and treatment.

COURSE 207

Crystal Room Period T-5

A. EDWARD MAUMENEE, M.D.
Baltimore

Surgical Indications for the Various Corneal Procedures

The use of conjunctival flap, keratectomy, lamellar corneal graft, and penetrating corneal graft will be discussed in relation to the treatment of corneal ulcers, keratitis, corneal dystrophies, and scars. The indications and contraindications for beta irradiation in the treatment of vascularization of the cornea before and after such surgical treatments will also be mentioned.

COURSE 208

Crystal Room Period M-5

P. ROBB McDONALD, M.D.
Philadelphia

Penetrating Wounds of the Eye: Management

A penetrating wound of the globe is usually a serious injury, and in approximately 50 per cent of the cases it results in the loss of useful vision. It is important to take a complete history, and in most instances a roentgenogram of the globe should be taken to rule out the presence of an intraocular foreign body. Systemic and local antibiotic therapy should be instituted, and then a decision should be made as to whether the patient requires operative intervention. The techniques and complications following repair of both corneal and scleral lacerations will be discussed. The management of intraocular foreign bodies and the author's preference of techniques for their removal will be outlined.

COURSE 209

Room 743 Period W-5 or Th-5

JAMES L. McGRAW, M.D.
Syracuse, N. Y.

Contact Lenses

In this course the relative merits of contact lenses as compared with spectacles will be presented. The advantages and disadvantages of the various types of contact lenses will be reviewed. Among the lenses to be discussed are the conventional fluid lens, the corneal lens, and the ventilated lens.

Comparative fitting time, wearing time, and subjective and objective effects of the various lenses will be discussed. Indications and contraindications for contact lenses will be presented.

COURSE 210

Room 726 Period W-6

WILLIAM P. McGUIRE, M.D.
Winchester, Va.

Cataract: Management of the Patient

This course is being offered for the first time because it is felt that some discussion of the management of the patient with cataract will be helpful. Discussion of the various surgical procedures will be held to a minimum. The psychological approach to the problem, both in the preoperative and postoperative phases, will be emphasized. Problems in refraction encountered in the rehabilitation of the patient with aphakia will also be considered in some detail.

COURSE 211

Room 727 Period Th-4

WILLIAM P. McGUIRE, M.D.
Winchester, Va.

Surgery of the Vertical Muscles

The actions of the vertically acting muscles will be outlined and discussed. Variations in these actions will be considered. Diagnostic procedures in cases of vertical palsy will be outlined, and

finally, various surgical methods of correcting vertical imbalances will be considered in detail. A short motion picture will be shown.

COURSE 212

Room 731 Period W-5 or Th-5

SAMUEL J. MEYER, M.D.
Chicago

Surgical Treatment of Glaucoma

The principles of the surgical treatment of glaucoma will be elaborated upon. The indications for the various types of operations will be correlated with the gonioscopic findings. Indications for surgery of the various secondary glaucomas will be given. The treatment of the complications of glaucoma surgery will be reviewed.

COURSE 213

Room 750 Period W-6

RICHARD A. MILLER, M.D.
Memphis

Corneal Diseases

This course will consist of a kodachrome picture demonstration of corneal diseases. A brief review of the normal histology and physiology of the cornea will be included along with diagnosis and treatment of the various dystrophies and diseases seen in practice.

COURSE 214

Room 711 Period W-5 or Th-5

W. HOWARD MORRISON, M.D.
Omaha

Office Management of Glaucoma

The control of glaucoma as an office procedure will be considered. Attention will be directed to the action of medications and their proper prescription. Particular emphasis will be placed upon the use of miotics together with oral Diamox.

The importance of the individual's phasic variation pattern in relation to the proper timing of treatment will be stressed.

The rate and frequency of tonography, tonometry, gonioscopy, ophthalmoscopy and biomicroscopy, refraction and perimetry will be discussed. A consideration of office records, environmental difficulties and patient education will be undertaken.

COURSE 215

Room 734 Period W-4 or Th-4

CARROLL R. MULLEN, M.D.
Philadelphia

Ophthalmic Emergencies

Treatment of acid and alkali burns of eye and adnexa, and causes of and treatment for sudden loss of vision, with special attention to anticoagulant medication, will be discussed. Value of roentgenologic studies in ocular injuries with consideration of emergency surgical approach and prognosis and handling of anterior chamber hemorrhages, iris prolapse, and iridodialysis will be studied. Emergency care of lid injuries and trauma to extraocular muscles will also be emphasized.

COURSE 216

Room 711 Period W-6

WILLIAM F. MURRAH, JR., M.D.
Memphis

Aids for Subnormal Vision: Clinical Evaluation

The author will list and classify the visual aids which he has used in improving the vision, either distance or near, of the patient whose best vision, aided or not aided by glasses, is poor and unsatisfactory.

These various aids for subnormal vision, including telescopic and microscopic devices, will be described and evaluated as to their physical characteristics and optical properties and how they may be used.

The amount of improvement found in the different grades of subnormally poor vision in a comprehensive series of patients following use of the various devices will be shown.

COURSE 217

Room 726 Period M-5

ROLAND H. MYERS, M.D.
Memphis

Vertical Phorias and Tropias

This course will consist primarily of a discussion of clinical cases illustrated with kodachrome slides showing patients before and after surgical intervention to correct vertical phorias and tropias. Measurements of the muscle deviations before and after intervention will be presented on lantern slides. The diagnosis and type of treatment given in each case will be discussed.

COURSE 218

Room 731 Period Th-4

FRANK W. NEWELL, M.D.
Chicago

Development of Refinements in Ophthalmic Surgery

This course is designed to present recent advances in the technique and instrumentation of ophthalmic surgery. Topics to be discussed include anesthesia, sterilization and protection of instruments, the prevention of intraocular contamination with foreign bodies, and recent surgical techniques. Emphasis will be upon those factors which have proved useful in practice.

COURSE 219

Room 721 Period W-6

KENNETH N. OGLE, Ph.D.
Rochester, Minn.
BY INVITATION

Stereopsis: Present Concept

In this course the basic facts of stereoscopic vision will be considered. The topics discussed will include (1) relationship to general space perception, (2) retinal correspondence, (3) disparate images, (4) stereoscopic sensation, (5) stereoscopic acuity, (6) limitations as to both distance and disparity, (7) relationship to fusional movements, and (8) duration of stimuli. Also, some theoretical and practical aspects of stereopsis will be considered. Much of the material for the course will be based on the results of research over the past decade.

COURSE 220

Room 721 Period Th-4

KENNETH N. OGLE, Ph.D.
Rochester, Minn.
BY INVITATION

Binocular Oculomotor Coordination and Imbalances

The physiologic and neurologic components of the convergence processes, especially as related to the accommodation-convergence association, to fusion and fusional movements, and to the accommodative convergence and the proximal convergence, will be considered. Also discussed will be the phenomenon of fixation disparity and its use as a tool for studying oculomotor imbalances, especially when the eyes are subject to the stress of prism vergences and changes in the stimulus to accommodation. The data of representative cases will be presented.

COURSE 221

Room 750 Period W-5 or Th-4

JAMES A. OLSON, M.D.
Detroit

Iritis, Iridocyclitis, Keratitis: Differential Diagnosis and Treatment

This course will present a review of the differential diagnostic points in nongranulomatous and granulomatous inflammations of the anterior uveal tract and the nonsuppurative inflammatory lesions of the cornea. Attention will be directed to the current methods of therapy, including the use of corticotropin

(ACTH), cortisone, and hydrocortisone. The efficacy of the various methods of administering these agents, the dosages, and the problem of prolonged treatment and repeated treatment will be discussed. The use of antibiotics and the other supportive therapeutic measures in selected cases will be presented. Attention will be directed to the continued importance of careful physical examinations and the subsequent correction of possible causative focal defects or generalized disease processes.

COURSE 222

Room 740 Period T-6

MORRIS S. OSHER, M.D.
Cincinnati

Diagnostic Approach to Squint Surgery

An accurate diagnosis based on the actions of the eye muscles is an absolute necessity for good postoperative results in the surgical correction of strabismus. An easy understanding of the main actions of the extraocular muscles will facilitate such preoperative diagnosis and will also make simple a quick diagnosis of the various muscle imbalances, particularly vertical imbalances. Tests for motility, convergence and fixation will help to determine specifically the muscle or muscles to be operated upon.

COURSE 223

Room 732 Period W-6

HUBERT O. PAULSON, M.D.
Lincoln, Neb.

Lighting for Comfortable and Accurate Seeing

Illumination plays as important a part in correction of asthenopia as do refractions and orthoptics. Many industrial and home visual tasks can be accomplished much more efficiently and comfortably with proper illumination. The five requirements of illumination will be presented according to more recent standards. The proper use of fluorescent and incandescent sources of light will be discussed.

COURSE 224

Room 732 Period M-4 or T-4

BRITTAIN F. PAYNE, M.D.
New York

Extraction of Complicated Cataract

The successful extraction of complicated cataracts depends on the experience of the surgeon, the preparation of the patient, good anesthesia, simple technique and reliable assistants.

1. Congenital and Juvenile Cataract. The operation for congenital cataract may revert to the simple discission procedure rather than the "two-stages" rapid extraction.
2. Cataracts Complicated by High Myopia and Fluid Vitreous. Extraction of the cataracts is successful if good anesthesia and control of the patient are obtained.
3. Cataract with Glaucoma Filtration. A filtering cicatrix with iris inclusion may be preserved by making a corneal incision anterior to it.
4. Discission Operation for Secondary Membrane. A secondary membrane may be resistant and require excessive manipulation to clear the pupil. Such procedures may cause iridocyclitis, detachment of the retina, or secondary glaucoma from hemorrhage.
5. Cataract Extraction with Glaucoma. Good anesthesia and softening of the eye with xylocaine and hydase are essential for successful extraction of the lens when the intraocular tension is increased. A generous iridectomy is necessary and should be used.

Kodachrome slides and motion pictures in color will be presented.

COURSE 225

Room 727 Period M-6 or T-6

CHARLES A. PERERA, M.D.
New York

Retinal Detachment

Successful surgery in serous detachment of the retina depends upon a knowledge of the etiologic factors, the preoperative study of the patient, and the

technique of operation. In addition to a discussion of these subjects, this course will deal with the prognosis as affected by preoperative and operative findings.

COURSE 226

Room 728 Period T-4

RALPH H. PINO, M.D.
Detroit
and
DAVID J. EDWARDS
Chicago
BY INVITATION

Problems in Bifocal Lenses

In this course the following principles will become evident:

1. The purpose of an optical system is to direct rays of light into determined pathways.
2. Aberration from every deviation from the optic axis opposes such a purpose.
3. Concern for the reading-point level is paramount.
4. No bifocal lens can be efficient unless it is properly set before the eyes.
5. The value of a lens can be nullified without scientific dispensing procedure.

The ways in which a lens functions will be visually demonstrated by drawings, by plastic forms, and by passing light rays through various types of bifocals to prove their relative values. The principles behind these phenomena will be discussed. The use of potter's clay in the teaching of optics will be demonstrated.

The value of prisms as the basic element of ophthalmic lenses and of refraction will become clear. Simple, readily applied methematical formulas will be furnished to show why a prescription written "Rx +10.00 Add +2.00" may easily become "+11.00 +2.75 ×180" in the segment.

Research on what the patient sees when reading through various types of segments will be discussed, and some of the frauds, fancies, and facts regarding vision will be pointed out. The values of scientific dispensing will become evident. The ethical responsibilities of ophthalmologists will be discussed.

COURSE 227

Room 728 Period W-4

RALPH H. PINO, M.D.
Detroit
and
DAVID J. EDWARDS
Chicago
BY INVITATION

Correction of Aphakia

The basic principles demonstrated in the previous course on bifocal lenses will be recapitulated, and the following principles bearing on clinical application will be emphasized:

1. The problems of all ophthalmic lenses and of optical systems are in direct proportion to the increasing dioptric power of the lenses used.
2. Consideration of the average distant level and the reading-point level is basic.
3. An optical center has little meaning except in relation to the optic axis and in alignment with the optic axis of the eye.
4. Usable fields of vision are decreased with every increase in dioptric value.
5. In cases of aphakia and of muscle dysfunction, and in many of the sight-saving types of cases, consideration of lens position is essential because of its relation to abnormal or abnormally functioning anatomy.
6. Every malplaced high dioptric lens placed before the eye produces an effect analogous to that of a luxated lens within the eye. The importance of scientific dispensing will be stressed.

The combined factors of science, education, economics, and ethics are so interdependent in the problems of dispensing ophthalmic lenses that each factor will be briefly discussed. We hope that we may help to clarify these aspects of our responsibilities as ophthalmologists as they relate to medical practice, and to all who directly or indirectly formulate our rules of ethics.

COURSE 228

Room 784 Period W-6

ADOLPH POSNER, M.D.
New York

Glaucomatocyclitic Crises

The syndrome of glaucomatocyclitic

crises constitutes a clinical entity which should be differentiated especially from acute angle-closure glaucoma. The syndrome is characterized by recurrent attacks of unilateral acute glaucoma, usually without marked congestion and associated with the presence of a small number of keratic precipitates. The diagnosis can be made from the history of recurrences and the slit lamp findings. This syndrome should be suspected in any case of acute glaucoma in which the angle is not closed during the phase of elevated ocular tension.

The course will deal with the clinical manifestations, differential diagnosis, and therapeutic management of glaucomatocyclitic crises.

COURSE 229

Room 786 Period M-6

M. HAYWARD POST, M.D.
St. Louis

Refinements of Refraction: Methods and Measures for Meeting the Problems Encountered

The discussion will be based upon practical experience. Technical skill and knowledge of the effect of general disease and ocular neuroses are essential. The mathematics of optics will be discussed only as necessary, for the basic principles of refraction are presumed to be understood.

Methods of refraction will be briefly reviewed, including the various types of retinoscopy, use of the keratometer, the astigmatic dial, and the cross cylinder. A grasp of all methods is essential in order that one method may be checked against another. In difficult cases, all will be needed.

Among the special problems to be discussed will be (1) inequality of accommodation, (2) inequality of the presbyopic addition, (3) convergence weakness in the presbyope, (4) vertical imbalance, (5) size difference of the images, (6) aniseikonia, and (7) aphakia.

The discussion will include problems in refraction based upon such factors as the mentality of the patient, the type of work he does, his inattention, fatigue, macular or perimacular lesions, binocular vision, and amblyopia.

Ocular neuroses will be considered very briefly, and a differentiation of psychoneurotic and psychosomatic individuals will be briefly touched upon.

COURSE 230

Room 716 Period W-6

LELAND H. PREWITT, M.D.
Ottumwa, Iowa

External Eye Diseases Associated with Allergy

I. Diagnosis
   a. Discussion of diagnostic procedures, including use of an allergic-history-and-treatment form covering the patient's life from infancy to the present illness
   b. Classification of lesions involving the lids, lid margins, lacrimal apparatus, conjunctiva, cornea and sclera into general groups, such as contact, atropic, infectious, seborrheic
   c. Demonstration of skin tests and cytology

II. Treatment
   a. Treatment by an elimination program in allergies due to (1) inhalants, (2) contactants, (3) foods, and (4) psychosomatic bases
   b. Establishment of dosage by (1) the titration method, (2) severity of patient's symptoms (using high, medium and low dose therapy)
   c. Use of specific therapy, nonspecific therapy, and psychotherapy, such as: specific, house dust antigen; nonspecific, staphylococcus toxoid; psychosomatic, search for underlying cause

III. Importance of constant re-evaluation of therapy and review of running history

IV. Case histories illustrated with colored slides

COURSE 231

Room 740 Period W-6

J. VAN DYKE QUEREAU, M.D.
Reading, Pa.

The Physiology of Ocular Movements

Before efficient progress can be made in the study of pathologic ocular movements, the confusion which surrounds normal ocular movements must be dispelled. In this course an attempt will be made to clarify and give some practical aspects of torsion and projection. Problems of binocular rotations will be demonstrated. Some simple methods for measuring rotation of the eye, which apply equally well in measuring squint, will be given.

COURSE 232

Room 727 Period W-6

M. ELLIOTT RANDOLPH, M.D.
Baltimore

Advanced Glaucoma: Treatment

This course will consist of a review of the rationale of various types of medical and/or surgical treatment of cases with advanced glaucoma, with analysis of particular types of advancing field defects and the appropriate medical or surgical treatment.

Advancing glaucoma in the presence of cataract, cataract following surgery for glaucoma, glaucoma in the presence of retinal lesions, and the control of pain in absolute glaucoma will be discussed.

COURSE 233

Room 781 Period W-6

A. BENEDICT RIZZUTI, M.D.
Brooklyn

Tumors of the Lids and Ocular Adnexa

This course will deal with a practical discussion of the more common tumors involving the lids and the ocular adnexa, including the lacrimal gland, lacrimal sac, caruncle, and orbit.

Highlights of the diagnostic clinical aspects, pathologic anatomy, and medical and surgical therapy will be emphasized. The salient features will be illustrated by colored lantern slides prepared by the author.

COURSE 234

Room 744 Period W-4

R. WINSTON ROBERTS, M.D.
Winston-Salem, N. C.

Early Diagnosis of Glaucoma

Success in treating glaucoma has proved to be much greater when therapy is begun early in the course of the disease. Screening techniques for early detection of glaucoma cases will be described. Detailed study of suspected cases will be discussed, including the use of modern techniques of tonometry, visual field testing, and especially tonography, provocative testing with tonography, and gonioscopic technique and interpretation. Findings used in a diagnosis and proper classification of very early glaucoma will be reviewed.

COURSE 235

Room 731 Period W-6

CARL J. RUDOLPH, M.D.
South Bend, Ind.

THEODORE F. SCHLAEGEL, JR., M.D.
Indianapolis

Chemotherapy

Because new agents are being developed at such a rapid rate that the ophthalmologist finds it difficult to keep abreast, this course will include a practical review of basic features of pharmacology and therapeutics as applied to ophthalmology. Both the local and systemic uses of the following groups of drugs will be discussed: antibiotics, sulfonamides, fungicides, and parasiticides.

COURSE 236

Room 750 Period T-5

ALBERT D. RUEDEMANN, JR., M.D.
Detroit

Body Changes Due to Error in Vertical Muscles

Congenital vertical muscle weakness causes changes in the whole body structure as it attempts to adapt to the requirement for binocular single vision. The changes include a head tilt, with compensatory shift of the whole spine to neutralize the ocular muscle defect and, at the same time, maintain a reasonably erect posture. The course will deal with these changes and their recognition.

COURSE 237

Room 710 Period M-6 or T-6

RALPH O. RYCHENER, M.D.
Memphis

The Lacrimal Apparatus

This course will present a general review of the lacrimal apparatus, with special emphasis on the treatment of some of the minor but rather troublesome phases encountered in private practice, as well as the more dramatic and quite satisfactory methods of tear sac surgery. The office management of congenital stenosis and the more popular techniques of dacryocystorhinostomy will be fully illustrated with slides.

COURSE 238

Room 715 Period W-4 or Th-4

HERMAN D. SCARNEY, M.D.
Detroit

Value of Slit Lamp (Biomicroscopy) in Office Diagnosis

The expensive initial investment in a biomicroscope, which has come to be recognized as an indispensable part of the examining equipment of the clinical ophthalmologist, can return many dividends in accuracy of diagnosis and prognosis, and in indications of possible procedure in treatment afforded by no other means.

The value of routine biomicroscopy in office diagnosis will be emphasized by presenting a series of kodachrome slides illustrating fairly common lesions of the lids, conjunctiva, cornea, anterior chamber, iris and lens. Biomicroscopy of the fundus with the Hruby lens will also be discussed.

COURSE 239

Room 795 Period T-6 or W-6

HAROLD G. SCHEIE, M.D.
Philadelphia

Surgery for Congenital Glaucoma

The surgical treatment of juvenile and infantile glaucoma will be discussed. The development of goniopuncture and the results obtained with this treatment in cases of juvenile glaucoma will be presented. The author's method of goniotomy for infantile glaucoma will be illustrated by slides and a motion picture. An analysis of the results obtained from goniotomy, goniopuncture, and a combination of the two will be made.

COURSE 240

Room 712 Period Th-4

VIRGIL J. SCHWARTZ, M.D.
Minneapolis

Eye Changes Associated with Skeletal Disease

The well-informed ophthalmologist must be able to recognize and classify the uncommon diseases and syndromes as well as the common pathologic conditions. This discussion will cover an interesting field, which may challenge our diagnostic acumen repeatedly.

After a brief review of embryology, and with the help of a quick-reference outline and illustrative slides, we shall consider the following groups of diseases:

1. Dysostoses: hypertelorism; Crouzon's disease; Romberg's disease; Treacher-Collins syndrome; Marfan's syndrome; Van der Hoeve's syndrome; Touraine-Solente-Gole syndrome; oxycephaly; melanosis; Hurler's syndrome; platybasia; Ehlers-Danlos syndrome; orbital hypoplasia; acromegaly; dwarfism with ectopia lentis
2. Collagen diseases: scleromalacia perforans; Bekhterev-Marie syndrome; Behcet's syndrome; Reiter's syndrome; Still's disease; Sjogren's disease
3. Metabolic diseases: Werner's syndrome; gout; osteomalacia
4. Torticollis
5. Phacomatoses: Bourneville's disease; Von Recklinghausen's disease
6. Abiotrophies and lipoidoses: Laurence-Moon-Biedl syndrome; xanthomatosis

Basic terminology will be defined. Anatomic and pathologic synonyms for the eponymic titles will be given.

COURSE 241

Room 733 Period W-6

JAMES S. SHIPMAN, M.D.
Camden, N. J.

Scleral Resection

1. The indications for this operation as a primary procedure:
   a. Failure of the detached retina to settle back in place with bed rest
   b. High myopia
   c. Aphakia
   d. Retinal folds or vitreous bands
   e. Failure of less formidable methods
2. Preoperative study and preparation of the patient
3. Operative procedure:
   a. Partial or lamellar type of resection less hazardous and preferable
   b. Anatomic landmarks on sclera, such as position of vortex veins, macula, recti, and oblique muscles
   c. Position, size and shape of the area of sclera to be resected
   d. The operative technique will be illustrated with slides, showing each step from beginning to end and a new technique of folding in portion of sclera
4. Postoperative treatment and management, complications, and results

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COURSE 242

Room 713 Period W-4

G. VICTOR SIMPSON, M.D.
Washington, D. C.

Convergence Insufficiency and Divergence Excess: Diagnosis and Nonsurgical Management

The diagnosis and nonsurgical management of horizontal muscle imbalances will be considered in this course. Emphasis will be given to the criteria for recognition of convergence insufficiency. The variations in which outward deviations of the eyes for distance occur will be discussed, and the findings upon which a diagnosis of divergence excess can be made will be given.

The proper use of the following measures in the management of these imbalances will be emphasized:

1. Correction of errors of refraction
2. Strengthening of convergence movements by pin-to-nose exercises and loose prism exercises
3. Use of prisms in glasses
4. Strengthening fusion by orthoptics
5. Cautioning the patient against allowing a relaxation of his attention to occur which results in day dreaming or staring

The management of divergence excess may be a failure under all forms of treatment unless suppression, which resulted when the one eye moved out, is properly understood and overcome. When suppression has been overcome, the treatment of divergence excess is very much like the management of convergence insufficiency.

COURSE 243

Room 713 Period Th-4

G. VICTOR SIMPSON, M.D.
Washington, D. C.

Probing of the Nasolacrimal Duct in the Adult: Indications and Technique

The aim of this course is to draw attention to a variety of symptoms, in addition to epiphora, which will be relieved by improving the drainage through the nasolacrimal duct.

Simple measures, such as dilating the puncti or syringing the canaliculi and nasolacrimal passages, are ineffective, but probing can be relied upon to correct the basic defect.

The subject will be discussed under the following headings:

1. Functions of the tears
2. Symptoms of inadequate drainage through the lacrimal passages or indications for probing
3. Determination of the patency of the lacrimal passages
4. Anatomy of the lacrimal passages
5. Frequency and position of strictures
6. Technique of probing
7. Presentation of new probing instruments
8. Evaluation of results

A motion picture will be presented showing the technique of the procedure of probing.

COURSE 244

Room 710 Period W-6

BYRON SMITH, M.D.
New York

Orbital Fractures

A short review of practical orbital anatomy will be followed by a classification of orbital fractures. Diagnostic measures, treatment and complications of early and late orbital fractures will be discussed. The course will be illustrated by slides and motion pictures.

COURSE 245

Room 728 Period Th-4

DANIEL SNYDACKER, M.D.
Chicago

Luxated and Subluxated Lenses: Treatment

The importance of a proper preoperative diagnosis will be stressed, since successful treatment is dependent upon the accurate recognition of various factors which will influence the choice of techniques.

The following conditions will be presented:

1. Congenital subluxation
2. Luxation into the anterior chamber
3. Subluxation
4. Luxation into the vitreous bowl

COURSE 246

Room 743 Period M-6

M. PUIG SOLANES, M.D.
Mexico, D. F.
BY INVITATION

Uveomeningitis Syndromes: A Special Group of Uveitides with Systemic Involvement

There is at present a trend to assemble in a common group, "uveomeningitis," three diseases: sympathetic ophthalmia, Harada's disease and Vogt-Koyanagi's syndrome. These three entities have in common a bilateral and severe uveitis with systemic involvement. This occurs as a rule in Vogt-Koyanagi's syndrome and Harada's disease, and occasionally in sympathetic ophthalmia.

The clinical and pathologic facts for the integration of this new nosographic group will be discussed in the course.

COURSE 247

Room 744 Period W-5

EDMUND B. SPAETH, M.D.
Philadelphia

Plastic Surgery: Practical Aspects

This course is designed for considera-

tion of the plastic correction of those defects of the eyelids and the orbit which result from the surgical therapy of malignant lesions of these structures. In discussing these cases, the surgical treatment of the lesion must be included. This portion of the discussion will be secondary, however, to the consideration of techniques for plastic reconstruction of the resultant defects. The subject will be subdivided to include (a) lid margin defects; (b) major lid reconstruction with an intact functioning eyeball; and (c) lid and orbital defects connected with an eviscerated orbit.

The course will cover the practical aspects of this subdivision of ophthalmic plastic surgery.

COURSE 248

Room 744 Period Th-4

EDMUND B. SPAETH, M.D.
Philadelphia

Selection of Operation for Complicated Ptosis

Congenital ptosis is truly an oculomotor situation in which extraocular muscles other than the levator are very frequently involved. The sequence of surgical procedures for all parts of the symptom complex is usually important in determining success or failure. In addition to correction of the oculomotor situation, complicated ptosis surgery includes, of necessity, correction of lid anomalies of the canthal angles represented by blepharophimosis and the various forms of epicanthus.

The surgical correction of these conditions will be considered.

COURSE 249

Room 743 Period W-4 or Th-4

HARRY B. STAUFFER, M.D.
Jefferson City, Mo.

Allergic Conditions of the Eye: Differential Diagnosis

Ocular allergy may resemble inflammations of nonallergic origin, such as bacterial and viral infections. Special emphasis will be placed on contact allergy, drug allergy, virus diseases, scleritis and uveitis. The differential diagnosis and treatment of ocular allergy will be illustrated by kodachrome slides and a review of case histories taken from a general ophthalmologic office practice.

COURSE 250

Crystal Room Period T-6

KENNETH C. SWAN, M.D.
Portland, Ore.

Value of Various Drugs Used in Glaucoma

In recent years some important new drugs for altering ocular tension have been discovered. Also, some new concepts have been added to our knowledge both of glaucoma and of the action of drugs. It will be the purpose of this lecture to discuss changes in the rationale for using various drugs and to evaluate these drugs in relation to the management of glaucoma.

COURSE 251

Room 715 Period M-4

I. S. TASSMAN, M.D.
Philadelphia

Retinopathy in Diabetes

The distinguishing features and significance of the vascular and retinal changes occurring in the course of diabetes will be described. The relationship of the retinopathy to other clinical manifestations of the disease will be discussed.

The association of dysfunction of the autonomic nervous system, the Kimmelstiel-Wilson syndrome, and vascular changes with diabetic retinopathy will be analyzed. Important factors which, under various conditions, will produce a

retinopathy in some individuals with diabetes and not in others will be discussed.

Management of the patient with diabetes and the effect of present-day therapy on the development of retinopathy in all stages of the disease will be considered.

COURSE 252

Room 732 Period W-4 or Th-4

FREDERICK H. THEODORE, M.D.
New York

Ocular Therapeutics

An appreciation of the potentialities and the limitations of the agents at our disposal is a prerequisite for effective therapy. Many new and potent drugs are now widely used in ocular therapeutics. Valuable as they are, their introduction has posed therapeutic problems other than the dangers from injudicious use.

A practical clinical approach will be made to the treatment of external diseases of the eye, with a critical evaluation of those drugs, both old and new, currently used for this purpose. The action of the drugs, indications and specific contraindications for their use, the capricious behavior and unreliability of some of them, and methods for their application will be considered in detail. The importance of vehicles in general, the choice of appropriate ones, and specific problems and dangers inherent in the prescribing of ophthalmic drugs will be stressed. The necessity for differentiating drug reactions due to allergy from drug reactions due to irritations will be discussed from the therapeutic point of view. General principles concerning the treatment of ocular eczemas will be outlined. The entire lecture will be illustrated by kodachrome lantern slides of clinical cases.

COURSE 253

Room 736 Period Th-4

DERRICK VAIL, M.D.
Chicago

Surgery of the Senile Cataract

This course will consist of a description and discussion of the various methods and techniques of cataract surgery, with emphasis on the mechanical principles involved. Time will be devoted to the various steps performed during the operation, leaving out the preoperative and postoperative care of the patient. Principles of various types of incision, instrumentation, a discussion of suture material, and principles of wound healing that have a bearing on the type of incision used will be emphasized. Particular attention will be paid to the application of forceps or erysiphake to the capsule of the lens, and the various types of delivery of the lens will be mentioned. The course will be illustrated with slides and motion pictures.

COURSE 254

Room 702 Period T-6

CLARENCE A. VEASEY, JR., M.D.
Spokane

Refraction Difficulties

In this course we shall assume that glasses have been prescribed and found correct, but the patient is still unhappy. Sources of discomfort considered include adjustment requirements for distance and near, necessary decentration of plus lenses, and the necessity for tilting, which requires a change in the optical center. Tilting induces an increase in sphere and cylinder; this can be calculated and allowed for.

Vertex distance is the distance between the cornea and posterior surface of the corrective lens. When vertex distance in the finished glasses differs from that of the trial frames, a change in strength of both sphere and cylinder is necessary and is calculated by a simple method. Anisometropia induces false hyperphoria resulting from the prismatic effect of compound lenses. The method of calculating amount of prism in any sphere-cylinder combination at any axis, and the resultant hyperphoria, will be explained. Methods of overcoming induced hyperphoria include change in adjustment, compensated segments, bicentric grinding, and prisms.

Also considered will be the relationship of convergence and accommodation, special problems of aphakia, and multifocal lenses. All calculations will involve arithmetic only and inspection of tables.

The discussion will be illustrated by lantern slides.

The tables essential to applying the principles elucidated in this course can be obtained in the author's instruction monograph, "Refraction Difficulties," published by the Academy.

COURSE 255

Room 702 Period T-5 or W-5

EVERETT R. VEIRS, M.D.
Temple, Texas

External Dacryocystorhinostomy and Corrective Procedures for Epiphora

The diagnosis and treatment of tear-sac infections will be presented. External dacryocystorhinostomy will be described in detail and illustrated by a motion picture and lantern slides.

The etiology and correction of epiphora in the various age groups will be discussed. Corrective measures will be illustrated, particularly stressing epiphora in the aged.

COURSE 256

Room 750 Period T-6

C. WILLIAM WEISSER, M.D.
Pittsburgh

Chronic Uveitis: Differential Diagnosis and Treatment

Common and rare conditions which either simulate uveitis or are associated with it will be discussed. The old and the new methods of treatment will be compared. A few illustrative cases will be discussed in detail.

COURSE 257

Room 702 Period W-4

JOHN P. WENDLAND, M.D.
Minneapolis

Chiasmal Lesions

The subject will be introduced by a brief discussion of the anatomy of the chiasmal region. Following this, the course will deal with various types of field defects which chiasmal lesions may present. Associated symptoms and specific causes of chiasmal lesions will be discussed next. Emphasis will be placed upon the fact that the responsibility for early diagnosis of lesions in the neighborhood of the chiasm rests primarily upon the ophthalmologist. Cases illustrating points discussed will be presented. In cases in which the lesion was the result of a neoplasm, a diagram of the chiasm and the tumor will be shown and correlated with the visual fields.

COURSE 258

Room 786 Period T-4

HAROLD F. WHALMAN, M.D.
Los Angeles

Practical Points in Eye Surgery

This broad subject will be narrowed down to certain particular considerations that are likely to ensure the most satisfactory results in eye surgery. Evaluation of patient personality and selection of cases for local or general anesthesia will be discussed. Aspects of operating room technique essential to asepsis and the

elimination of irritants will be described. The use and abuse of medication such as sedatives and antibiotics will be discussed, as well as the application of local medication, dressings, and general protective measures for the eye following the operation. A few selected surgical procedures will be described.

COURSE 259

Room 715 Period W-6

GEORGE N. WISE, M.D.
New York

Retinal Vascular Disease: Its Mechanism and Therapeutic Indications

The embryologic background and the mechanism of new vessel formation in certain vascular diseases of the mature retina will be discussed first. Therapeutic indications, reasons for some therapeutic failures, and indications for new approaches in treatment will be analyzed. Kodachrome slides will be shown.

COURSE 260

Room 778 Period T-4 or W-4

EVERET H. WOOD, M.D.
Madison, Wis.

Central Retinal Lesions: Diagnosis and Treatment

This course will begin with a brief review of the anatomy, embryology and physiology of the retina, particularly of the macular region. A discussion of various inflammatory and degenerative conditions in the macular region will be included. Particular attention will be paid to the macular lesions in elderly people and to the management of such cases. The course will be illustrated by lantern slides, both kodachrome and black-and-white.

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CONTINUOUS COURSES AND PANEL DISCUSSIONS
OTOLARYNGOLOGY

COURSE 301

Room 705 Periods T-1, T-2

DAVID W. BREWER, M.D.
and
F. BERTRAM BRIESS
BY INVITATION
Syracuse, N. Y.

Voice Therapy

A two-period course—$4.00

Many principles of voice therapy have been known to European laryngologists and voice investigators for many years. American recognition, application, and advancement of these principles is a very recent chapter. Many voice abnormalities present no recognizable laryngoscopic appearance. Further vocal abuse may result in visible singer's nodes, contact ulcers, edematous cords, and polypoid changes.

Speech therapists have dealt with some success with a few of these problems. Surgery usually spells recurrence. Relaxation techniques give good results in many cases; yet the same approach may produce damage in such a large number of patients that it should not be used indiscriminately.

Voice therapy directed toward production of dynamic equilibrium of the intrinsic and cricothyroid muscles causes the disappearance of the visible lesions and the audible abnormalities. Methods of testing and treating currently being used by one laryngologist-voice therapist team will be presented. The lecture will be illustrated by model and tape recordings.

COURSE 302

Room 706 Periods T-2, T-3

COURSE 303

Room 706 Periods Th-2, Th-3

SAMUEL COHEN, M.D.
Philadelphia

The Nasal Cartilages

A two-period course—$4.00

This two-hour course is being presented twice, as Course 302 on Tuesday and as Course 303 on Thursday. **Please select course number according to day on which you wish to attend.**

The normal and pathologic anatomy of the nasal cartilages will be discussed. The following points will be stressed:

1. Anatomy of the dislocated septal cartilage; disappointing results with the Matzenbaum technique
2. The columellar plates; a new method of raising the nasal tip and narrowing the nostril floors
3. The lower border of the lateral plate of the tip cartilage
4. Various methods of tip cartilage surgery; the fallacies of each method; the author's method

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COURSE 304

Room 710 Periods T-1, T-2

COURSE 305

Room 710 Periods W-2, W-3

JOHN J. CONLEY, M.D.

JOHN F. DALY, M.D.
and
MAURICE LENZ, M.D.
BY INVITATION
New York

Carcinoma of the Head and Neck: Diagnosis and Treatment

A two-period course—$4.00

This two-hour course is being presented twice, as Course 304 on Tuesday and as Course 305 on Wednesday. **Please select course number according to day on which you wish to attend.**

The course includes an analysis of cancers involving all the major systems of the head and neck area: the various types of malignant tumors involving the epithelium, sinuses, ears, lips, tongue, buccal mucosa, palate, nasopharynx, floor of the mouth, hypopharynx, parotid gland, cervical lymphatics, thyroid gland and cervical esophagus (larynx intentionally omitted because of its inclusion in other courses).

A discussion of the diagnosis of these malignant tumors will be based on the

pertinent factors in the history, physical examination, roentgenograms, chemical tests, and various biopsy techniques relative to each case.

Emphasis will be placed on the use of supervoltage in the treatment of malignant tumors of the head and neck.

A discussion of treatment will include the curative effects of various types of surgery and irradiation and combinations of these two techniques. It will also include the worthwhile palliative efforts in the management of incurable cancer by surgery, irradiation or combinations of these techniques.

COURSE 306

Room 722 Periods T-2, T-3

JOHN MARQUIS CONVERSE, M.D.
New York

Nasal Plastic Surgery—Basic

A two-period course—$4.00

The main steps in the typical corrective nasal plastic operation will be reviewed. The course will be illustrated by slides and motion pictures.

COURSE 307

Room 722 Periods W-2, W-3

JOHN MARQUIS CONVERSE, M.D.
New York

Nasal Plastic Surgery—Advanced

A two-period course—$4.00

This course is more advanced than the preceding one and deals with conditions such as nasal deviations and saddle nose, in addition to the main steps in the typical corrective nasal plastic operation.

COURSE 308

Room 711 Periods T-1, T-2

COURSE 309

Room 711 Periods W-1, W-2

KENNETH L. CRAFT, M.D.
Indianapolis

Nasal Allergy

A two-period course—$4.00

This two-hour course is being presented twice, as Course 308 on Tuesday and Course 309 on Wednesday. **Please select course number according to day on which you wish to attend.**

I. Symptoms of nasal allergy
II. Diagnostic procedures in nasal allergy
  A. History
  B. Examination of nose
  C. Roentgen examination
  D. Cytology of nasal secretions
  E. Nasal polyps: their significance
  F. Skin tests
III. Treatment of nasal allergy
  A. Nonspecific treatment
  B. Specific treatment
  C. Surgery in nasal allergy
IV. Case reports demonstrating points discused in diagnosis and treatment
V. Questions and open discussion

COURSE 310

Room 712 Periods W-2, W-3

COURSE 311

Room 712 Periods Th-2, Th-3

MEYER S. FOX, M.D.
Milwaukee

Noise in Industry

A two-period course—$4.00

This two-hour course is being presented twice, as Course 310 on Wednesday and as Course 311 on Thursday. **Please select course number according to day on which you wish to attend.**

Topics for Discussion

1. The physical aspects of noise, its measurement, and its effect upon man
2. The medical aspects of hearing loss due to noise exposure
3. The determination of hearing loss and hearing disability resulting from noise exposure
4. The medical-legal aspects of noise deafness
5. Hearing-conservation programs in industry

This course has been planned for otolaryngologists who are actively engaged in hearing-conservation programs in industry and for any others who are interested in the industrial noise problem. The presentation will consist of an informal panel discussion by members of the Subcommittee on Noise in Industry who have been very active in the field of industrial noise. Emphasis will be placed upon practical measures and a realistic approach to the problem. The presentation will be supplemented by charts, slides and tape recordings taken from actual industrial situations.

Those planning to attend this course who have questions regarding particular problems which they wish to have discussed should submit them by mail or in person before the conference begins. A question period will be provided, and an opportunity will also be afforded anyone in attendance who may wish to relate his experiences in meeting various problems in the field of industrial noise.

COURSE 312

Room 715 Periods T-1, T-2

COURSE 313

Room 715 Periods Th-1, Th-2

FRENCH K. HANSEL, M.D.
St. Louis

Allergy and Medical Otolaryngology

A two-period course—$4.00

This two-hour course is being presented twice, as Course 312 on Tuesday and Course 313 on Thursday. **Please select course number according to day on which you wish to attend.**

The problems of medical otolaryngology are varied, multiple and ever changing. In many instances the indications for surgical interference must be evaluated only after medical treatment and observation. The management of the patient, therefore, is directed to the consideration of disease and loss of function which affect the ears, nose and throat, and related structures. These problems concern allergy, infection, immunity, anemia, malnutrition, dental caries, effects of tobacco and alcohol, endocrine deficiencies, loss of function as manifested by vascular headaches, vertigo and tinnitus, deafness, psychosomatic disturbances and other related conditions.

COURSE 314

Room 715 Periods W-1, W-2

FRED HARBERT, M.D.
Philadelphia

Clinical Audiology

A two-period course—$4.00

The usual and exceptional findings in the three types of deafness, conductive, nerve, and end-organ, will be outlined and discussed. Basic principles responsible for these findings will be emphasized, making liberal use of slides illustrating cases which demonstrate these principles. The role of tuning forks, pure tone audiometry, and speech audiometry will be considered from a practical standpoint.

Bone conduction, masking, and recruitment will be particularly stressed, mainly by illustrative cases. The main consideration will be diagnosis and the need for various rehabilitative procedures as indicated by diagnostic findings.

COURSE 315

Room 716 Periods T-2, T-3

COURSE 316

Room 716 Periods Th-2, Th-3

WILLIAM G. HARDY, Ph.D.
BY INVITATION

MIRIAM D. PAULS, Ph.D.
BY INVITATION
Baltimore

Clinical Audiology for Young Children

A two-period course—$4.00

This two-hour course is being presented twice, as Course 315 on Tuesday and

Course 316 on Thursday. **Please select course number according to day on which you wish to attend.**

With infants and preschool children, particularly those with delayed speech, special techniques must be used to evaluate the hearing function and its relation to the child's development and behavior. Several techniques (employing calibrated toys and noise-makers, tuning forks, pure tone and speech audiometry, masking, and the like) will be considered in detail. These range from what is useful in ordinary office practice to procedures involving special facilities.

Particular attention will be given to current "objective" procedures whereby a child is conditioned to respond to test sounds. Some details of management will be discussed, and there will be consideration of the relation between various causal factors and test findings and the development of language and speech in the child.

COURSE 317

Room 724 Periods T-1, T-2

ANDERSON C. HILDING, M.D.
Duluth, Minn.

Physiology of Hearing as Related to Hearing Loss and its Therapy

A two-period course—$4.00

Despite the fact that many theories of hearing have been advanced during the past 300 years, no one has yet demonstrated conclusively how we hear. The etiology and pathology of some of the commonest ear complaints are unknown.

In an attempt better to understand the internal ear, the normal anatomy of this structure, as it is presently understood, will be briefly described preparatory to discussing some intensive studies in dissection of the cochlea. These studies elucidate some of the characteristics and anatomic relations of the tectorial membrane and the motion of the cochlear partition. An attempt will be made to answer two questions which always present themselves whenever a theory of hearing is postulated: (1) How does stimulation of the hair cells actually take place? (2) How is the stimulation localized when the whole cochlea and everything within it is vibrating with forced vibration in response to sound?

The concepts which will be presented in explanation of these questions have immediate application in the pathology of perception deafness in general and in acoustic trauma in particular. The 4096 dip, characteristic of the initial perception type of deafness, may be explained on this basis. There are some preventive measures suggested by these findings.

COURSE 318

Room 713 Periods T-1, T-2

External Pyramid Reconstruction

A two-period course—$4.00

T-1—Kenneth H. Hinderer, M.D.
Pittsburgh

Incisions for Approaching Nasal Structures and Methods of Exposure

Adequate exposure of the structures in nasal surgery is very necessary to obtain good results. Incisions should be as few in number as possible and minimal in length, but they should provide maximum exposure in order that every portion of the septum and nasal pyramid may be reached. They also should be planned to provide a minimum amount of postoperative reaction. Each incision has a purpose in attaining sufficient mobility of these structures to reconstruct them and to replace them into their normal contour.

This discussion will present the rationale of each incision. It will be illustrated by kodachrome slides.

T-2—Ivan W. Philpott, M.D.
Denver

Medial and Lateral Osteotomies and Deficiencies of the Nasal Roof

There are two types of medial osteotomies, intraseptal and intranasal. Each of these can be modified to preserve or to sacrifice the keystone area. Indications for and the technique of these operations will be described. Lateral osteotomies are, in the main, of two types, vestibu-

lar and alar. Indications for and techniques of both types will be discussed. Brief mention of other types of osteotomies, such as the external Mosher type, will also be considered. The level of the osteotomy cut in relation to the baseline will be discussed. A description of outfracture and infracture and a consideration of how to handle the thickened nasal frontal spine will be discussed. A brief description of deficiencies of the nasal roof with case reports will be given.

COURSE 319

Room 731 Periods T-2, T-3

COURSE 320

Room 731 Periods Th-2, Th-3

HOWARD P. HOUSE, M.D.
Los Angeles

Surgery for Chronic Ear Disease; The Concept of Tympanoplasty

A two-period course—$4.00

This two-hour course is being presented twice, as Course 319 on Tuesday and as Course 320 on Thursday. **Please select course number according to day on which you wish to attend.**

The changing concept of surgery for chronic ear disease will be discussed, with emphasis on hearing restoration.

The indications for surgical intervention and the techniques used to carry out this changing concept with regard to tympanoplasty will be presented and fully illustrated.

The importance of proper and adequate postoperative care will be stressed.

COURSE 321

Room 724 Periods Th-1, Th-2

VARAZTAD H. KAZANJIAN, M.D.
Boston

JOHN MARQUIS CONVERSE, M.D.
New York

EDGAR M. HOLMES, M.D.
Boston

Traumatic Injuries of the Face

A two-period course—$4.00

The symposium on early treatment of facial injuries, to be held during the first period, will cover (1) emergency measures consisting of the control of primary hemorrhage, traumatic shock, and other necessary first aid measures; (2) local examination of lacerations and fractures of the face plus general physical examination; and (3) early treatment of soft tissues, primary and late primary suturing of lacerations, and the immobilization of fractures with special reference to fractures of the nasal, zygomatic and maxillary bones.

The second period will be utilized for a symposium on treatment of deformities of the face of traumatic origin, including discussion of (1) some general principles of reconstructive surgery of the face, and (2) repair of deformities involving soft tissues only, including (a) conspicuous scars without apparent loss of tissue, (b) defects with definite loss of tissue requiring use of pedicle or skin grafts, (c) special areas such as the eyelids and eyebrows, and (d) stenosis of the nasal passages.

COURSE 322

Room 728 Periods T-1, T-2

COURSE 323

Room 728 Periods W-1, W-2

FRANK D. LATHROP, M.D.

MOSES H. LURIE, M.D.

BERNARD ZONDERMAN, M.D.
Boston

Your Otological Office Problems: Panel Discussion

A two-period course—$4.00

This two-hour course is being presented twice, as Course 322 on Tuesday and Course 323 on Wednesday. **Please select course number according to day on which you wish to attend.**

In this course there will be a full and frank discussion by each member of the panel of his particular ideas in the management of the otological problems that will be presented. The discussion will be open to all present and will not be limited to the panel itself. The panel will not select the subjects but will discuss those topics pertaining to office management of

otolaryngology presented by members of the class. This is a good opportunity to have a free and frank discussion of your problems as they present themselves in your office.

COURSE 324

Room 712 Periods T-1, T-2

MERLE LAWRENCE, Ph.D.
Ann Arbor, Mich.
BY INVITATION

Sound Conduction in the Normal, the Pathologic and the Reconstructed Middle Ear: Essential Aspects

A two-period course—$4.00

This course is an elementary explanation of the acousticomechanical properties of the middle ear apparatus. Those anatomic characteristics of the ear that provide for efficient transfer of air-borne sound vibrations to the fluids of the inner ear will be discussed. The various ways that structural alteration or disease processes can affect these middle ear properties, together with the basic principles that must be adhered to in restoring adequate sound conduction, will be described.

The material covered will be divided into two parts. In part one the normal actions of the middle ear as a mechanical transformer will be described, and the reasons for certain patterns of audiometric loss due to various pathologic conditions explained.

In part two, methods of middle ear reconstruction that can satisfactorily reestablish the mechanical principles that make the normal ear an efficient device will be evaluated, and the effects of different procedures on the resulting audiogram discussed.

COURSE 325

Room 710 Periods Th-1, Th-2

JOHN R. LINDSAY, M.D.
Chicago

Deafness and Dizziness of Vascular Origin

A two-period course—$4.00

Vascular lesions may affect the auditory and vestibular mechanisms either together or separately and in varying degrees. A lack of factual information as to the nature and location of these lesions has made the diagnosis and interpretation inadequate. A number of experiments on animals have been done in our laboratory which illustrate the possible effect of certain vascular lesions on function. A series of cases also has been selected to illustrate the various clinical types. The discussion will consist of a presentation of clinical types along with the evidence which has been obtained from experimentation.

COURSE 326

Room 731 Periods W-2, W-3

COURSE 327

Room 732 Periods Th-2, Th-3

WERNER MUELLER, M.D.
Jamaica Plain, Mass.

ARTHUR L. JUERS, M.D.
Louisville, Ky.

SCOTT N. REGER, Ph.D.
Iowa City, Iowa

and

ALAN S. FELDMAN, Ph.D.
Boston
BY INVITATION

What the Otologist Should Know About Hearing Aids

A two-period course—$4.00

This two-hour course is being presented twice, as Course 326 on Wednesday and Course 327 on Thursday. **Please select course number according to day on which you wish to attend.**

This will be an informal question-and-answer symposium on hearing-aid problems as they arise in daily otologic practice. The participants are invited to submit such questions as the following:

When does a hard-of-hearing patient need a hearing aid?

What are the comparative merits of bone and air conduction instruments?

What are the limitations of a hearing aid?

Which is the best hearing aid?

How should the patient go about getting a hearing aid?

What can the otologist do to combat high-pressure salesmanship?

COURSE 328

Room 726 Periods T-2, T-3

External Pyramid Reconstruction

A two-period course—$4.00

T-2—Charles J. Petrillo, M.D.
New Haven, Conn.

Surgical Anatomy and Physiology of Vaults and Lobule

This lecture is designed for the beginner in rhinologic surgery. The details of the anatomy will be demonstrated from laboratory dissections and from life. The nasal valve and the baffle system will be described and demonstrated. Ballooning and returning of the upper lateral cartilages will be illustrated. Ethnic variations and comparisons with lower animals will be used for their value and understanding of basic concepts presented.

T-3—James Chessen, M.D.
Denver

The Joseph Rhinoplasty

The basic principles of rhinoplasty formulated by Joseph over 50 years ago, constituting the basic technique used by most plastic surgeons and by many in the field of otolaryngology, will be discussed as to their present-day validity.

Changes in some concepts will be discussed. Failures and pitfalls as well as some of the major technical problems will be illustrated.

COURSE 329

Room 726 Periods W-2, W-3

GEORGE F. REED, M.D.

and

BLAIR McCLOSKEY, M.D.
BY INVITATION

OREN BROWN, Ph.D.
BY INVITATION
Boston

Voice Therapy

A two-period course—$4.00

This panel will discuss various aspects of voice therapy, from both the medical and vocal aspects. Under the heading "medical aspects," we will be concerned with the various types of laryngeal disease which respond to voice therapy, and the altered laryngeal physiology leading to these disorders. From the vocal viewpoint, the therapists will attempt to describe accurately, but simply, the techniques used in treatment of various types of laryngeal disorders. The statistical results of voice therapy in various types of disease, and tape recordings of patients' voices before and after therapy, will be presented.

COURSE 330

Room 716 Periods W-1, W-2

External Pyramid Reconstruction

A two-period course—$4.00

W-1—Ralph H. Riggs, M.D.
Shreveport, La.

Combining Total Septum Corrections

The general principles of performing a total septum operation, along with rhinoplastic procedures involved, will be discussed in detail. This will include techniques by which one may preserve the supports of the various parts of the nose and septal mucous membranes, and also retain a cylinder of mucosa in each nasal cavity.

There will be a review of some of the complications of the septum operation, with emphasis on how to help prevent and correct them during the procedure.

Discussion of some procedures used to help prevent sequelae of external nasal pyramid surgery or injury will be stressed.

Slides, both kodachrome and black-and-white, will be used to supplement the discussion.

W-2—Carl B. Sputh, Jr., M.D.
Indianapolis

Management of Nasal Injuries

This lecture will cover the management of nasal injuries by use of surgical principles which will be emphasized in associated courses. It will stress especially the physiologic and anatomic injuries to the nose which were sustained in childhood. The slides will show how early nasal injuries often result in deformities of the nose, faulty dentition, and facial and palatal asymmetries.

COURSE 331

Room 721 Periods T-1, T-2

WILLIAM H. SAUNDERS, M.D.
Columbus, Ohio

Oropharyngeal Lesions: Correlation of Clinical and Microscopic Appearances

A two-period course—$4.00

Color photographs of interesting oral and pharyngeal lesions will be shown; simultaneously, the microscopic appearances of these lesions will be demonstrated by color photomicrographs. Pertinent correlations will be pointed out. Particular attention will be given to normal variations, premalignant lesions, the "white" lesions of the mouth, and certain uncommon infections and neoplasms.

COURSE 332

Room 721 Periods W-1, W-2

COURSE 333

Room 721 Periods Th-1, Th-2

ALBERT P. SELTZER, M.D.
Philadelphia

A Typical Rhinoplasty

A two-period course—$4.00

This two-hour course will be presented twice, as Course 332 on Wednesday and Course 333 on Thursday. **Please select course number according to day on which you wish to attend.**

A typical rhinoplasty will be described. This presentation will include a discussion of the basic principles involved and will be illustrated step-by-step to the postsurgical result. Instruments, including the electric saw, will be presented in detail.

COURSE 334

Room 722 Periods Th-1, Th-2

HERMAN SEMENOV, M.D.
Beverly Hills, Calif.

Ear, Nose and Throat Therapeutics Brought Up to Date

A two-period course—$4.00

COURSE 335

Room 724 Periods W-2, W-3

HANS VON LEDEN, M.D.

and

PAUL MOORE, Ph.D.
BY INVITATION
Chicago

Organic Voice Problems

A two-period course—$4.00

This course presents a practical introduction to voice problems and their relation to laryngeal physiology. It is intended for the practicing laryngologist who is interesteed in vocal rehabilitation.

The discussion will extend to diagnosis and therapy of all common organic voice problems, and will stress close collaboration between the laryngologist and voice therapist in achieving optimum results.

Slow-motion pictures of laryngeal function, obtained with an ultrahigh-speed camera, will be presented to illustrate normal and abnormal laryngeal function.

COURSE 336

Room 733 Periods T-1, T-2

COURSE 337

Room 733 Periods Th-1, Th-2

THEODORE E. WALSH, M.D.
St. Louis

What Can Be Done For Deafness

A two-period course—$4.00

This two-hour course in being presented twice, as Course 336 on Tuesday and as Course 337 on Thursday. **Please select course number according to day on which you wish to attend.**

The problems of relieving deafness, including the efficacy or failure of various forms of treatment and surgery, will be considered. The value of hearing aids and rehabilitation measures for cases which cannot be helped by medical or surgical means will be discussed. The apparent success of quackery will be explained. The members of the course are encouraged to submit questions and to join actively in an informal discussion of the subject.

COURSE 338

Room 732 Periods T-2, T-3

COURSE 339

Room 732 Periods W-2, W-3

WALTER P. WORK, M.D.
San Francisco

Techniques in Wide Field Laryngectomy

A two-period course—$4.00

This two-hour course is being presented twice, as Course 338 on Tuesday and as Course 339 on Wednesday. **Please select course number according to day on which you wish to attend.**

This course is designed primarily for those persons who are in training in otorhinolaryngology and for those who have shown some interest and aptitude in neck surgery.

The detailed step-by-step techniques in wide-field laryngectomy will be emphasized by means of lantern slides and colored motion pictures. The approach to surgical intervention in this region of the neck will be further stressed according to fascial planes and pertinent anatomic structures as worked out using fresh cadaver material, cross-section studies, and techniques and procedures in the operating room. The low collar incision which the author uses will be illustrated.

INDIVIDUAL COURSES — OTOLARYNGOLOGY

COURSE 401

Room 705 Period T-3

LUCIAN W. ALEXANDER, M.D.
New Orleans

The Adenoid Problem

There is no operation in surgery so badly done in such a large percentage of cases as the adenoid operation. A discussion of the many techniques, failure in results, postoperative treatment to avoid middle ear infections, management of adenoid remnants, and case histories will be presented.

Kodachrome slides will be used.

COURSE 402

Room 710 Period T-3 or Th-3

FRANZ ALTMANN, M.D.
New York

Tympanoplasty

Antibiotics and the increased knowledge of the physiology of sound conduction have brought about a profound change in our attitude towards the operative treatment of chronic middle ear infections.

Although the elimination of the infection remains the main purpose, one should, whenever feasible, attempt to restore the greatest possible amount of hearing, provided that it can be done without jeopardizing the primary goal of the intervention.

There are three prerequisites for the success of restorative operations: satisfactory condition of the inner ear and nerve; proper function of the two windows; patency of the eustachian tube.

The operations aim at complete or partial reconstruction of the tympanic cavity and, as far as possible, of the ossicular chain. This is achieved through a kind of modified radical mastoidectomy and the use of skin grafts.

The procedure to be followed in the three situations most commonly encountered is discussed: cases with dry central perforations; cases with large marginal perforations and disease of the bony walls but without interruption of the ossicular chain; cases in which the drum and the two outer ossicles are absent or had to be removed because of extensive disease or after a previous radical mastoidectomy.

COURSE 403

Room 777 Period T-3

JACK R. ANDERSON, M.D.
New Orleans

Rhinoplasty: Practical Considerations

The purpose of this course is to discuss certain preoperative and postoperative procedures which have been found to lessen morbidity following rhinoplasty. Certain variations of technique which have been found to simplify the procedure will also be discussed.

COURSE 404

Room 710 Period W-1

DANIEL C. BAKER, JR., M.D.
New York

Chronic Cough in Children

Chronic cough is one of the most common symptoms that the pediatrician and otolaryngologist have to deal with. It may be a symptom of serious organic disease. It is present in almost every case of upper respiratory infection, and the latter is a common illness of children. Aside from infection, there is a large group of respiratory conditions which can cause chronic cough. Differential diagnosis in this group is frequently difficult, because the etiologic factor is obscured by the presence of secondary infection. The problem will be fully discussed.

COURSE 405

Room 712 Period T-3 or Th-1

OSCAR J. BECKER, M.D.
Chicago

Plastic Surgery for Protruding Ears

An original technique for correcting protruding ears is to be presented. This method has proved highly satisfactory in reproducing the normal contours of the auricle and in setting the ear back to the head at the proper angle.

The anatomy of the external ear, the etiology and pathology of protruding ears, and a historical survey of operative procedures will be included in the discussion.

COURSE 406

Room 731 Period W-1 or Th-1

RICHARD J. BELLUCCI, M.D.
New York

Surgery of the Stapes and Oval Window: Basic Considerations

The surgically important anatomic characteristics of the tympanic membrane, stapes, oval window, and other structures in the operation for mobilization of the stapes will be discussed.

The technical considerations involved in performing the operation on the stapes and oval window will be discussed. An evaluation of the advantages and limitations of this surgical procedure will be presented.

COURSE 407

Room 706 Period T-1 or Th-1

LAWRENCE R. BOIES, M.D.
Minneapolis

Neurological Disorders in Otolaryngology

Among the various specialties in medical practice, the one that overlaps most with our specialty of Otolaryngology seems to be Neurology.

Otolaryngologists have been criticized in the past for being too narrow in their appreciation of the significance of certain symptoms in our field of work, and some of this criticism has been justified.

If one will begin with the first cranial nerve and list the disorders that have symptoms associated with the function of each of the twelve cranial nerves, he will find that these symptoms are in many instances otolaryngologic symptoms. Examples are such disorders as multiple sclerosis, amyotrophic lateral sclerosis, and myasthenia gravis.

An otolaryngologist who is a good physician must be familiar with the neurological disorders that cause symptoms in the upper respiratory tract. These symptoms may be of diseases that he is not expected to treat or even to diagnose fully, except that he is expected to be an authority on lesions of the eighth nerve and also of the seventh nerve insofar as its passage through the temporal bone is concerned.

It will be the principal point of this discussion to consider those neurological disorders with symptoms in the upper respiratory tract.

COURSE 408

Room 705 Period Th-3

NATHAN A. BOLOTOW, M.D.
Providence, R. I.

Recent Advances in Rhinoplasty

Any applied art, such as rhinoplasty, becomes obsolete within a few years because of the constantly increasing information, the modification of the surgeon's view, and his greater experience. An attempt will be made to present the newer concepts and techniques in the process of shortening of the nose, modeling of the lobule, narrowing of the nasal pyramid, and hump removal. Unsolved problems in rhinoplasty will be discussed.

COURSE 409

Room 726 Period T-1

WESLEY H. BRADLEY, M.D.
Syracuse, N. Y.

Sudden Deafness

Sudden unexplained loss of hearing in an otherwise healthy individual is a most distressing symptom to the individual so afflicted. To the physician whom this pa-

tient consults, the problem is often puzzling from an etiologic, a therapeutic, and a prognostic standpoint.

An effort will be made in this course to establish a logical method of analyzing and understanding such cases from an etiologic viewpoint. Once this can be achieved, a more rational approach toward therapy and prognosis is possible.

Illustrative cases will be presented for demonstration and discussion.

COURSE 410

Room 728 Period W-3

FRIEDRICH S. BRODNITZ, M.D.
New York

Actor and Singer as Patients of the Otolaryngologist

Singers and actors form a group of growing importance in the practice of the laryngologist. To handle these patients well requires an understanding of the techniques involved in the professional use of the voice and of the medical, occupational and psychological problems of the artist.

A review of this field will be presented by dealing with the following topics of practical importance:

1. Check-up examination of the vocal organs
2. Technical problems of professional singing and speaking
3. Infection in the vocal organs of the artist
4. Evaluation of local treatments
5. Handling of emergencies
6. Judging the fitness to perform
7. Psychology of the artist-patient
8. Differential diagnosis of functional voice disturbances

COURSE 411

Room 728 Period Th-2

FRIEDRICH S. BRODNITZ, M.D.
New York

Vocal Rehabilitation in Benign Lesions of the Vocal Cords

In such conditions as nodules, polyps and polypoid thickening of the cords, and contact ulcers, the abuse or misuse of the voice is the main cause and the disturbance of vocal function is the chief complaint. Therefore, the yardstick for the success of any treatment is not the laryngoscopic appearance of the cords but the improvement of the voice.

The goal of vocal rehabilitation is the restoration of vocal function and the prevention of recurrences. The following topics will be discussed as an introduction to vocal rehabilitation as an integral part of the management of benign lesions of the cords:

1. Mechanics of voice disturbances
2. Conservative or surgical treatment
3. Postoperative management
4. Techniques of vocal rehabilitation
5. Special consideration of the professional use of the voice.

The course will be illustrated by tape recordings.

COURSE 412

Room 711 Period W-3 or Th-3

NORTON CANFIELD, M.D.
New Haven, Conn.

Speech Audiometry for the Practicing Otologist

The advantages of speech audiometry, as aided by new electronic instruments, will be compared to those of pure tone audiometry as a practical tool for determining auditory acuity.

The techniques used in speech audiometry will be discussed.

The value of the speech audiometer in testing hearing aids will be stressed, and cases in which it has proved its worth will be cited.

Use of the speech audiometer in testing speech reception and auditory discrimination will be explained. The psychological insight concerning the patient gained when the otologist does the testing himself will be pointed out.

The speech audiometer has proved even more successful in testing the hearing of children, and methods for testing and observing the reactions of young children to speech sounds will be described.

Finally, mention will be made of the advantages of this instrument in tests for malingering.

COURSE 413

Room 777 or Room 743 — Period W-3 or Period Th-3

LOUIS H. CLERF, M.D.
St. Petersburg, Fla.

Causes of Hoarseness with Particular Reference to Treatment

This course will be devoted to a brief consideration of the symptom "hoarseness" and the diagnosis of conditions producing it.

Diseases of the larynx will be discussed, especially from the standpoint of treatment, and many of the more common typical and atypical laryngeal lesions will be shown on kodachrome slides and in a motion picture.

COURSE 414

Room 721 — Period T-3 or W-3

CLAUDE C. CODY, III, M.D.
Houston, Texas

Eustachian Tube: Management of Pathologic Conditions

Management of pathologic conditions of the eustachian tube is a subject that confronts every practicing otolaryngologist. Every physician, from the youngest to the oldest, sees countless numbers of patients with complaints referable to the eustachian tubes. Unfortunately, many symptoms are erroneously attributed to the eustachian tube when this is not the real seat of trouble.

A working classification of lesions of the eustachian tube, suppurative and nonsuppurative, in both the young and old, will be offered. Kodachrome slides will be shown demonstrating the eardrums of children which show various stages of retraction and various stages of effusion. The relationship of such conditions to hearing will be stressed. Management, including adenoidectomy, myringotomy with suction, inflation, and the possible use of radium and roentgen therapy, will be covered. Our changing concepts regarding suppurative otitis media and serous otitis media and their relationship to hearing will be developed.

Serous otitis media and adhesive otitis media, and the problems they present in adult patients, will be dealt with along with various methods of management.

Vertigo and its possible relation to tubal obstruction will be reviewed. Especial emphasis will be placed on office management of tubal obstruction. The methods for its diagnosis and treatment will be thoroughly covered. A short motion picture on equipment and technique used in tubal obstruction in routine office practice will be shown.

COURSE 415

Room 713 — Period W-2 or Th-2

LAWRENCE S. CRISPELL, M.D.
Joplin, Mo.

Otolaryngologic Allergy in Children

Diagnosis and treatment of pediatric allergy as it pertains to the practice of the otorhinolaryngologist will be discussed. An effort will be made to show how such treatment will fit easily into everyday office practice. Allergy and its relationship to recurring colds, sinusitis, tonsillectomy, adenoidectomy, deafness and bronchitis will be discussed.

COURSE 416

Room 705 — Period W-1

LEE W. DEAN, JR., M.D.
Clayton, Mo.

Practical Neuro-otolaryngology

A review of some of the neurological conditions that confront the otolaryngologist. Emphasis will be placed on aspects of anatomy, diagnosis and treatment as found more commonly only in the neurological literature.

The course will cover the cranial nuclei and tracts involved in such conditions as facial paralysis, the cerebellar syndrome, cerebellopontine angle lesions, multiple sclerosis, trigeminal neuralgia, and lesions producing paralysis of the pharynx, larynx, tongue and esophagus.

COURSE 417

Room 722 Period Th-3

EUGENE L. DERLACKI, M.D.
Chicago

Conductive Deafness: Office Management

After the diagnosis of a conductive hearing impairment has been made, proper office management includes all of the therapeutic and rehabilitative medical measures in our armamentarium of office procedures as well as the proper selection of cases for various surgical procedures available for the preservation or restoration of practical hearing.

The diagnosis and treatment of chronic secretory otitis media and chronic suppurative otitis media with central perforations, as well as the use of various prostheses and our technique of perforation repair, will be included among the discussions and demonstrations.

COURSE 418

Room 733 Period T-3 or W-3

DAVID D. DeWEESE, M.D.
Portland, Ore.

The Problem of the Dizzy Patient

This course will include a discussion of the factors to be taken into consideration in making a differential diagnosis of the patient who comes to the physician with the complaint of "dizziness." There will be remarks on the importance of certain facets of history taking. There will also be a discussion of nystagmus and of the value and interpretation of labyrinthine tests. A workable outline of those diseases and conditions which must be taken into account when considering the symptom of dizziness will be presented. An attempt will be made to keep in mind those practical points which are of value in differential diagnosis of this symptom in everyday practice. Treatment of certain types of dizziness and vertigo will be considered.

COURSE 419

Room 777 Period T-2

JOHN T. DICKINSON, M.D.
Pittsburgh

Bone Grafts: Present Status in Head and Neck Surgery

The success of any graft is based upon the operator's knowledge of the material being used. With bone, this begins with an understanding of its growth and repair and its fate as a graft. From these studies we find that the incorporation of a bone graft is chiefly a biochemical process that is not dependent upon the presence of viable osteocytes. Further observation shows that simply supplying these biochemical factors will not guarantee the success of the graft. Bone cannot be used as a universal "stuffing agent." It should never be used in a situation lacking the basic functional demand for bone.

If a bone graft has been decided upon for the correction of a particular deformity, the type and source of bone to be used must be selected. Cancellous bone has greater osteogenic properties than its cortical counterpart. Cortical grafts are used to supply internal fixation. Fresh autogenous bone remains the undisputed champion, and its source, preparation, and application to various deformities will be discussed in detail.

Circumstances arise in which the source of autogenous bone is limited, as when the patient is a child. At other times, it is not necessary to subject the patient to the additional trauma induced by taking autogenous bone. Deformities, such as those due to a mandibular cyst, respond well to preserved homogenous bone. The results from the use of frozen homografts over the past eight years will be summarized. The function of the frozen-bone bank will be elaborated, showing the effects of freezing on bone, the source and storage of the bone, and its clinical adaptations.

The more recent work with bone preserved in serum will be discussed, although there has not been sufficient time for a proper follow-up analysis of cases in which it has been used.

COURSE 420

Room 732 Period W-1 or Th-1

FRED W. DIXON, M.D.
Cleveland

Lesions of the Oral Cavity

Lesions of the oral cavity may be benign or malignant. Kodachrome slides

illustrating some fifty diseases commonly seen will be presented. Treatment of these diseases will be discussed.

COURSE 421

Room 732 Period T-1

DAVID A. DOLOWITZ, M.D.
Salt Lake City

Adrenal Steroids as Anti-inflammatory Agents

Inflammation will be considered as a nonspecific reaction of the organism to injury. Regardless of the site affected, it is a reaction of the interstitial connective tissue. Degree of inflammation depends on the nature and the amount of irritating substance.

Investigation indicates that certain adrenocortical steroids tend to decrease inflammatory response to a wide variety of stimuli. They act on the inflammation rather than on the agent inducing the inflammation. Inflammation is reduced in dose-response fashion. Various steroids have different anti-inflammatory potencies. The steroids act locally.

Clinical application of these principles will be discussed and demonstrated.

COURSE 422

Room 733 Period W-1

THOMAS F. DOUGHERTY, Ph.D.
Salt Lake City
BY INVITATION

Adrenal Cortical Steroid Hormones: The Relation of the Anti-inflammatory to the Antiallergic Effects

The material to be presented is concerned primarily with the relationship of the adrenal cortical steroid hormones to the local allergy-induced inflammatory response. The allergic response differs from other types of acute inflammation primarily in the mechanisms of its induction. In other words, the antigen-antibody mechanism triggers a hormone, which in turn induces an inflammatory response similar to that induced by other inflaming stimuli. The influence of adenocortical steroids on the various phenomena in allergy will be analyzed; for example, the roles of cortisone in suppressing anti-inflammation, increasing antibody release, and in addition, the influences of this hormone on inflammation will all be analyzed with respect to the allergy-suppressing effects of adrenocortical steroids. These influences will be discussed with respect to the part they may play in induction of the disease as well as the use of adrenal steroids as anti-inflammatory and antiallergic agents. Emphasis is to be placed on the fundamental knowledge concerning the anti-inflammatory effects of adrenal steroids and the way in which this knowledge can be applied to practical problems of dosage and treatment.

COURSE 423

Room 715 Period T-3 or W-3

JOHN B. ERICH, M.D.
Rochester, Minn.

Fractures of the Facial Bones

This course will deal with fractures involving the mandible, maxilla, malar and nasal bones. The methods of treatment which have been found most effective at the Mayo Clinic will be stressed, and classifications which facilitate the management of some of these traumatic injuries will be discussed.

COURSE 424

Room 733 Period W-2

J. BROWN FARRIOR, M.D.
Tampa, Fla.

The Fenestration Operation: Surgical Technique and Causes of Failure

This course describes in detail those steps in surgical technique which ensure maximum and lasting restoration of hearing through the fenestration operation. Although greatest stress is placed upon the microscopic perfection of the window and the flap, the technique is described from the incision to the application of the skin graft.

COURSE 425

Room 733 Period Th-3

J. BROWN FARRIOR, M.D.
Tampa, Fla.

Practicing Practical Otology

The purpose of this course is to summarize present-day otology and audiology, and to make it useful to the busy otolaryngologist. The author will present his methods for the diagnosis, treatment, and surgical procedures of diseases of the external, middle, and inner ear.

The antibiotics, cortisone, and acetic acid-alcohol will be discussed in relation to external otitis.

The following topics will be discussed:

1. Secondary myringotomy in the treatment of otitis media
2. The use of the polyethylene tube in secretory otitis
3. The relationship of adenoidectomy and irradiation in recurrent otitis
4. The treatment of chronic otitis media
5. The use of the Zollner probe in the selection of cases for tympanoplasty and mastoid surgery presented
6. The postoperative care and management of mastoid and fenestration cavities

Vertigo will be discussed. A few points will be made in regard to the symptoms which result from abnormal patency of the eustachian tube. The value of the Valsalva maneuver will be stressed. The diagnosis of Meniere's disease will be discussed with particular reference to caloric testing and recruitment. The ABC test for recruitment will be presented. Hearing testing, and the home study of lip reading will be outlined.

The present status of stapes mobilization and fenestration surgery will be summarized and essential refinements in technique will be presented.

COURSE 426

Room 711 Period T-3

ALAN S. FELDMAN, Ph.D.
Boston
BY INVITATION

Office Hearing Testing of Young Children

The increasing demand for early diagnosis of hearing impairments in children and improvement of school programs providing for the detection of hearing losses have resulted in broadening demands for audiometric evaluation of children at an early age. This course is designed to demonstrate the simple methods which the otologist may employ to assess hearing in his routine examinations of the older preschool child and some younger school-age children. Consideration will be given to gross sound testing, pure tone audiometric techniques applicable to the preschool child, and simple methods of validating results which may be carried out in the daily office procedure.

COURSE 427

Room 727 Period T-1

CHARLES F. FERGUSON, M.D.
Boston

Pediatric Bronchography: Its Present Status

Indications for bronchography in infants and children will be discussed, and many representative bronchograms will be demonstrated. These bronchograms illustrate various causes of tracheal and/or bronchial compression, such as anomalies of the aortic arch and great vessels (double aortic arch, right aortic arch with tight left ligamentum, anomalous innominate or carotid vessels), agenesis of the lung, tracheoesophageal fistula, and congenital anomalies of the tracheobronchial tree. Causes of bronchiectasis will be outlined, including unresolved pneumonia, postpertussis, foreign bodies, mucoviscidosis, and congenital anomalies. Extralaryngeal causes of "congenital stridor" will be discussed. A brief resume of our technique for bronchography used at the Children's Medical Center in Boston will be given.

COURSE 428

Room 727 Period T-2 or W-2

EDMUND P. FOWLER, JR., M.D.
New York

Facial Paralysis and Tics

This course will include discussion of the following points:

1. Etiology of neuritis of the seventh nerve
2. Bell's palsy
3. Traumatic injuries of the facial nerve, including those instant to fracture of the temporal bone
4. Tumor invasion

Special attention will be paid to the pathologic changes incident to repair and methods of decompressing and grafting the nerve. There will also be a discussion of the medical management of Bell's palsy, postrecovery associated movements, and involuntary twitches or tics.

COURSE 430

Room 724 Period T-3 or Th-3

A. C. FURSTENBERG, M.D.
Ann Arbor, Mich.

Management of Nasal Obstruction

A discussion of nasal obstruction will stress the reflex and inflammatory symptoms of this disorder. Particular emphasis will be placed upon the role of the turbinates in nasal obstruction and its symptoms. Allergic factors will be referred to in a consideration of adequate and effective treatment.

COURSE 431

Room 716 Period T-1 or W-3

WARREN H. GARDNER, Ph.D.
Cleveland
BY INVITATION

Practical Voice Therapy

Defective voice production will be classified according to the cause of dysfunction of the vocal cords: abnormal functioning of the overlaid biologic and psychophysiologic processes, or lesions that arise on or near the glottal margins of the vocal cords or that prevent adequate approximation. Methods of therapy will be presented which have been successful in eradicating those aspects of malfunction that are responsible for certain deviations and in bolstering surviving functions to supplement actions or parts not capable of complete restoration. Recordings will be generously used to illustrate types of problems and improvement.

COURSE 432

Room 713 Period T-3

ARAM GLORIG, M.D.
Los Angeles

The Otologist and the Noise Problem

The subject of noise in industry has raised many questions which are new to the otologist. The purpose of this course is to review the problem and to present the latest information regarding the relation of hearing loss to noise exposure and its medicolegal implications. There is a great need for standardization of hearing conservation programs in industry. This course is designed to assist in promoting such standardization among the otolaryngologists.

COURSE 433

Room 711 Period Th-2

ARAM GLORIG, M.D.
Los Angeles

The Otolaryngologist and Hearing Aid Selection

The purpose of the course will be to answer many of the questions surrounding selection of a hearing aid, especially those which the "hearing loss patient" directs to the physician when he is informed that a hearing aid will be necessary.

COURSE 434

Room 713 Period W-1 or Th-1

JOSEPH L. GOLDMAN, M.D.
New York

Vasomotor Rhinitis

This course will deal with the common, nonatopic, hypersensitive type of

rhinitis. The physiologic basis for this condition will be explained along lines which will permit rational management to be better understood. Diagnostic features of vasomotor rhinitis will be presented, stressing newer bacteriologic and cytologic criteria. Therapy will be discussed, pointing out indications for drugs, submucous electrocoagulation and surgery.

COURSE 435

Room 722 Period T-1 or W-1

VICTOR GOODHILL, M.D.
Los Angeles

Personal Techniques in Stapes Mobilization

Since the surgical approach of stapes mobilization is a therapeutic attack on a number of diseases involving the oval window (loosely called otosclerosis), it is necessary that the surgical techniques be varied to meet the pathologic changes specifically encountered.

Accordingly, my personal surgical approach in stapes mobilization involves a methodical monitored anatomic approach utilizing a number of instruments and a number of maneuvers individually selected to meet the special problems encountered. Thus, the technique may be either transincudal, transcapitular, transcrural, or transfootplate. A number of instruments are necessary to implement these various approaches. These include both digitally controlled and engine-controlled instruments.

The surgical procedure is always monitored by the nomographic technique of surgical audiometry.

Surgical instruments will be demonstrated along with magnifying, illuminating, and audiometric equipment.

COURSE 436

Room 721 Period Th-3

VICTOR GOODHILL, M.D.
Los Angeles

Endotympanic Surgery

Recent advances in stapes mobilization and tympanoplastic surgery have made it necessary to emphasize the procedure of exploratory tympanotomy. Surgical exploration of the tympanum is the basic procedure involved in the attack on conductive deafness, since the accurate diagnosis can only be made by exposure of the middle ear and direct observation of the pathologic changes responsible for the conductive lesion. Thus, exploratory tympanotomy is important not only in suspected otosclerosis and tympanic fibrosis but also in persistent tympanic effusion, suspected glomus tumor, intractible otalgia, chronic otalgia, tympanic exostoses and many other lesions of the middle ear.

In most instances such exploratory tympanotomy can be satisfactorily performed through the trans-speculum route and does not require a major endaural incision and transmastoid approach.

Special instruments for the surgical procedure are needed, along with expert use of the acoustic probe under magnified illumination. Monitored audiometric techniques are important in many procedures other than the classical stapes mobilization procedure for otosclerosis. These techniques are emphasized and demonstrated.

Special equipment used in endotympanic surgery, including a self-retaining ear speculum, guarded dental burs, ultrafine suction tips, specially angulated knives, and microcurets, will be demonstrated.

COURSE 437

Room 727 Period W-1 or Th-1

A. BRUCE GRAHAM, Ph.D.
BY INVITATION

and

J. LEWIS DILL, M.D.
Detroit

Advanced Audiologic Techniques for the Otologist's Office

Detailed audiologic evaluations have become increasingly important in the practice of otology. University and medical centers customarily have full facilities for such evaluation available, but in many instances otologists in their office practice have felt limited to routine audiometry. This course is designed to

demonstrate the versatility of good clinical audiometry, in a reasonably quiet room, in providing the otologist with audiologic information concerning speech reception thresholds, discrimination ability, recruitment, difference limen, and other such information critical in referring patients for hearing aids, in differentiating between acoustic neurinoma and Meniere's disease, and in making educational referrals.

COURSE 438

Room 727 Period T-3 or W-3

EUGENE L. GRANDON, M.D.
Iowa City, Iowa
BY INVITATION

Pulsion Diverticulum of the Hypopharynx

Surgical techniques for treating this condition have developed as a result of the advances made in diagnosis, in the understanding of surgical anatomy, anesthetic techniques and surgical physiology, and in the prevention and control of infection.

The course will consist of a discussion regarding the stages of the disease, the indications for surgical repair, and illustrations of pertinent surgical anatomy.

A 19-minute motion picture of the surgical removal of a moderate-sized Zenker's diverticulum in an elderly patient will be shown. It will include preoperative esophagrams, preliminary esophagoscopy, and the diverticulum and esophageal lumen as seen through the esophagoscope. Anatomic relations will be emphasized in the technique of one-stage diverticulectomy.

COURSE 439

Room 712 Period W-1

FREDERICK R. GUILFORD, M.D.
WILLIAM K. WRIGHT, M.D.
Houston, Texas

Permeatal Otologic Surgery

It is our purpose to review our experience with the permeatal approach to surgery of the external auditory canal, middle ear and mastoid antrum. The majority of the work has been done directly through the meatus of the external auditory canal without an external incision (permeatal approach), but a small T incision is occasionally required in the roof and posterior wall of the canal in order to attain better visualization. The main subject material will be devoted to technique and results of stapes mobilization and tympanoplasty. However, additional discussion will include the technique of the hypotympanic approach for tumors of the glomus jugulare and the permeatal approach (Tumarkin) for cholesteatomas of the epitympanic area and mastoid antrum. The permeatal approach for the removal of exostosis of the external auditory canal will also be considered. Slides and motion pictures will be used as instructional aids.

COURSE 440

Room 705 Period W-2

LESTER L. HALE, Ph.D.
Athens, Ohio
BY INVITATION

Voice Therapy Related to Clinical Otolaryngology

This course is designed to describe speech symptoms associated with organic and psychogenic disorders routinely seen in the practice of otolaryngology. Rationale will be given for recommended vocal care in the clinical management of laryngeal disorders, and specific techniques will be described for obtaining vocal changes for therapeutic purposes. Tape recordings of cases will be played to illustrate and support the presentation.

COURSE 441

Room 706 Period W-3
or or
Room 705 Period Th-1

O. ERIK HALLBERG, M.D.
Rochester, Minn.

Severe Nosebleed and Its Management

Nasal hemorrhages seldom are due to deficiencies in the clotting mechanism of the blood. They occur frequently from

early childhood through puberty, but during this period of life they are not often serious. Severe epistaxis is essentially a geriatric problem, since the incidence increases directly with age. The anatomy of the blood supply to the nose will be discussed in some detail because this factor is very important in the decision regarding what type of treatment should be used. Different methods of localizing bleeding points will be discussed in detail, since the site of the bleeding will decide the type of treatment to be used. Different types of cautery, packing, surgical procedures and supportive measures also will be discussed at length.

COURSE 442

Room 705 Period W-3

JOSEPH W. HAMPSEY, M.D.
Pittsburgh

Sinusitis in Children

While the clinical picture of sinusitis in children does not differ essentially from that in adults, the inability of the child to describe his symptoms accurately necessitates a greater reliance upon objective findings. The appearance of the nasal mucosa and the microscopic study of nasal and sinus secretions are the principal means of diagnosing and following these cases. Roentgenograms in these cases are less reliable than in those of adults because of the thickness of the bones of the face.

The main problem is that of chronic sinusitis. Since allergy is usually a prominent factor in the chronic sinusitis of children, it must be given adequate consideration in the management of this disease. The proper use of antibiotics, conservative treatment of the nose and sinuses, and rational vaccine therapy are also very helpful in relieving these young patients. A re-evaluation of the tonsil and adenoid problem may be desirable in the light of these advances.

COURSE 443

Room 734 Period T-2

HERBERT P. HARKINS, M.D.
Philadelphia

Routine Office Management of Allergic Patients

The modern otolaryngologist daily sees patients who are suffering from allergy of the ear, nose and throat. It is essential that he be able to diagnose these conditions accurately and to outline effective and complete therapy.

The essential features of the following procedures will be discussed:

1. History taking
2. The clinical examination of the ear, nose and throat
3. Necessary laboratory studies to be performed in the office
4. Skin testing
5. Desensitization, both standard and high dilution
6. Elimination diets
7. Office surgical procedures

The course will be illustrated by lantern slides which show necessary equipment and techniques.

COURSE 444

Room 734 Period T-1

HERBERT H. HARRIS, M.D.
Houston, Texas

Nasal Polypi: Medical and Surgical Aspects in Management

Nasal polypi pose a problem for all otolaryngologists—one in which the solution is not always easy. Although nasal polypi are in many, perhaps most, cases a product of allergy, the causative factor in this recurring problem is not allergy per se; it is infection as well.

Some features of the anatomy and lymphatic drainage of the nose will be considered. The use of the corticosteroids in treatment, the use of radium, and

finally recourse to surgery, particularly in relation to the maxillary and ethmoid sinuses, will be evaluated and discussed.

COURSE 445

Room 734 Period T-3

ROGER A. HARVEY, M.D.
Chicago
BY INVITATION

Interpretation of Roentgenograms of Sinuses, Mastoids and Chest

The contribution of technical refinements will be introduced. Discrepancies between transillumination of paranasal sinuses and roentgen studies will be correlated; false fluid levels, polyps and hyperplasia differentiated; trauma and neoplasm illustrated; and significant findings just outside the sinus area interpreted. Soft-tissue confusion and mastoid developmental variations will be discussed in relation to acute, chronic, and destructive changes. Techniques for demonstrating salivary calculi, symptom-producing lesions of the soft tissues and bones of the neck, and acute lesions of the chest will be illustrated.

COURSE 446

Room 734 Period W-1

JEROME A. HILGER, M.D.
St. Paul, Minn.

The Injured Malar Bone

Injury to the malar bone is exceedingly common. It is almost routinely associated with fracture of the abutting maxilla. It is frequently accompanied also by injury to the nasal complex or to the mandible. The fracture may involve only the arch, it may involve all four of the "weak" points of attachment, or it may actually involve extensive comminution of the body of the bone itself. Reparative methods suitable to the different types of injury constitute the material for this discussion.

COURSE 447

Room 734 Period Th-1

JEROME A. HILGER, M.D.
St. Paul, Minn.

Acute Nasal Injuries: Their Management

The simpler forms of nasal fracture rarely present a difficult problem in repair. This is not true, however, of those injuries which require open reduction of the nasal septum or direct skeletal fixation. This discussion will center mainly about reparative approaches to such injuries.

COURSE 448

Room 738 Period T-1 or W-1

RAYMOND L. HILSINGER, M.D.
Cincinnati

Vascular Headaches

In the far past all complicated headaches were considered migraine. In the more recent past, since the work of Horton, Wolff and Friedman, much has been done to classify the various types of vascular headaches. However, the pendulum, as usual, has swung too far to the other side, and now there is far too much classification. If this continues, each little cranial artery will have its own headache syndrome.

In this course a very simple classification of vascular headaches will be proposed, and general diagnosis and treatment of both vasodilating and vasospastic headaches will be discussed. The symptomatic and prophylactic aspects of treatment will be considered.

COURSE 449

Room 731 Period T-1

PAUL H. HOLINGER, M.D.

KENNETH C. JOHNSTON, M.D.
Chicago

Bronchoscopic Techniques

Improvements in bronchoscopic techniques have contributed substantially to

the advances in medical and surgical management of diseases of the chest. Various types of local and general anesthesia for bronchoscopy will be discussed, with indication of the advantages and disadvantages of each. New instruments with improved lighting and optical systems will be shown. Special equipment and procedures for bronchoscopy in infants will be thoroughly considered. Techniques for removing tissue for biopsy, endoscopic resection techniques and other special endoscopic procedures will be illustrated. The various ways in which bronchography may be done will be described.

COURSE 450

Room 734 Period Th-2

PAUL H. HOLINGER, M.D.

KENNETH C. JOHNSTON, M.D.
Chicago

Pediatric Laryngology

This course will begin with a brief consideration of clinical aspects of the anatomy and physiology of the infant larynx. Next the roentgenographic and laryngoscopic methods of examining the infant larynx will be discussed. Congenital anomalies, birth injuries of the larynx, and a review of problems of hoarseness in the infant and child will be illustrated by endoscopic motion pictures. Laryngeal obstruction and tracheotomy in the infant will be considered in the discussion of acquired lesions such as laryngotracheobronchitis.

COURSE 451

Room 724 Period W-1

HOWARD P. HOUSE, M.D.
Los Angeles

The Stapes Mobilization Procedure: Personal Experiences

A brief history of stapes mobilization will be presented. A general discussion of the indications for the operation, the techniques used, and results attained will be given.

The course will be illustrated by lantern slides and a motion picture on techniques.

COURSE 452

Room 734 Period W-2

EDLEY H. JONES, M.D.
Vicksburg, Miss.

Allergic Rhinitis: Diagnosis and Treatment

Patients with allergic rhinitis are best treated by an otolaryngologist who is qualified to make allergic studies. Any interested otolaryngologist can qualify himself to do this work. The necessary equipment is not expensive and the procedures are not difficult, but they do require time and study.

This course will include a discussion of the diagnosis and treatment of these cases—pertinent points in history taking, clinical examination, laboratory studies, skin tests, elimination diets and desensitization therapy. It is designed to aid both the otolaryngologists who wish to study nasal allergy and those who have already entered the field but are having difficulties in allergic management.

COURSE 453

Room 738 Period T-2

LEWIS W. JORDAN, M.D.
Portland, Ore.

Recent Nasal Fractures: Management

Recent advances in rhinoplasty by otolaryngologists for the improvement of nasal function have directed attention to more precise methods for the handling of nasal fractures. The proper management of these injuries will prevent much later disability.

This course will present a practical approach to the management of the fractured nose. It will include discussion of (1) pathologic changes; (2) methods of making an early diagnosis; (3) use of

local anesthesia; (4) correction of displaced bony fragments; (5) reduction of septal fractures; (6) open reduction in cases which cannot be corrected by closed methods; (7) application of external and internal dressings; (8) nasal injuries in children; and (9) old fractures.

COURSE 454

Room 728 Period T-3 or Th-1

ARTHUR L. JUERS, M.D.
Louisville, Ky.

Preservation of Hearing in Surgery for Chronic Ear Disease

Preservation or restoration of hearing in surgery for chronic attic and middle ear disease is dependent on a comprehensive understanding of the following aspects of the problem:

1. Genesis of attic perforation with or without cholesteatoma (cholesteatosis)
2. Indications for surgery
3. Interpretation of pathologic condition
4. Reconstruction of a new hearing mechanism when a functioning ossicular chain needs to be removed (myringostapediopexy)

Kodachrome slides of wax models will be used to show salient features of surgical technique. Illustrative audiograms will be discussed in relation to the mechanics of sound conduction before and after surgery.

COURSE 455

Room 713 Period W-3

SHULAMITH KASTEIN
New York
BY INVITATION

Disorders of Communication in Children Referred for Hearing Tests: Differential Diagnosis

Children referred for hearing tests because of a diminished or absent response to spoken language show various degrees of dysfunction in their language and speech development.

Since language and speech functions depend upon the action and interaction of peripheral and central organs within a frame of emotional equilibrium, defects in any one of these areas may constitute causative or contributory factors in the clinical picture of the child referred for a hearing test because of deficient communication.

A practical clinical method for obtaining a reliable diagnostic impression through a specially designed battery of tests will be discussed. This evaluation is concerned with the total child, his physical, social and mental development, his emotional adjustment, as well as his peripheral and central perception and interpretation of stimuli. It is based on a study concerned with the following problems:

1. The causative and contributory factors in the inability of a child to hear or use his hearing and the concomitant disorder of communication

2. The frequency with which causes other than a peripheral hearing loss are found in a group of children referred for the testing of hearing because of disorders of communication

3. Specific patterns of diagnostic profiles

COURSE 456

Room 738 Period W-2

JOSEPH I. KEMLER, M.D.
Baltimore

Bilateral Thyrotomy for Carcinoma of the Larynx

The reason for this operation will be given. The types of carcinoma of the larynx for which this operation is suitable will be discussed. The technique will be described in full detail with explanation of the various steps. Mirror laryngoscopy with removal of tissue for biopsy and diagnosis by the indirect method will be demonstrated.

This presentation will be illustrated by colored slides, and a colored motion picture of the operation will be shown. The analysis and results will be discussed.

COURSE 457

Room 738 Period T-3

HEINRICH G. KOBRAK, M.D., Ph.D.
Clarkston, Mich.

Treatment of Middle Ear Deafness

Various forms of hearing impairment due to sound conduction lesions will be demonstrated by photographs of the eardrum and compared with the audiologic findings.

The recent methods for treatment of nonotosclerotic conduction-type deafness will be outlined, and tests for selecting the proper patient for the proper procedure will be demonstrated.

A classification of middle ear deafness into five distinct subentities will be outlined, and the prognosis and therapeutic possibilities will be explained.

Slides, a motion picture and new instruments will be shown.

COURSE 458

Room 744 Period T-1 or W-1

CLAIR M. KOS, M.D.
Iowa City, Iowa

Stapedial Mobilization

Stapes mobilization, practiced during the late nineteenth century, discarded, and then recently revived, is a current subject of considerable interest in the otological profession.

For the time being, at least, it may be said that the procedure is successful in improving hearing in an appreciable number of patients. However, it is not an adequate substitute for the fenestration operation. It does, nevertheless, offer hearing improvement to some patients who could not expect improvement by fenestration surgery.

Stapes mobilization is not a procedure for the casual operator or the opportunistic surgeon. One should be prepared to proceed with the fenestration operation later, if this is advisable.

Surgical techniques, criteria for selection of cases suitable for operation, possible complications, and results are essential considerations to be discussed.

COURSE 459

Room 743 Period T-1

LT. COL. RALPH N. KRAUS (MC)
Randolph Air Force Base, Texas

Adventures in Space: Otolaryngologic Aspects

Space does not have a sharp boundary but is a gradual transition from the atmosphere as far as manned flight is concerned. For example, the physiologic zero point in the oxygen pressure of the atmosphere is reached at 50,000 feet. The zero point of air pressure is reached at 63,000 (boiling occurs). These parameters of space have already been conquered. Weightlessness becomes permanent above 120 miles. Personal observations during the weightless state will be presented. Otolaryngologic problems that may be encountered in space flight as well as in current flight in jet airliners, such as aerosinusitis, aerotitis and rapid decompression, will be discussed.

COURSE 460

Room 743 Period W-1 or Th-1

FRANCIS L. LEDERER, M.D.
Chicago

Otolaryngologic Misadventures in Diagnosis and Treatment

The challenging array of symptoms, symptom-complexes and signs confronting the otolaryngologist is replete with possible transgressions, errors, and pitfalls in diagnosis and treatment. Among the signs and symptoms offered for discussion are nasal blockage, headache, dizziness, dysphagia, nasal discharge, otalgia, hoarseness, aural discharge, obstructive states of the airway, sore throat, epistaxis, tinnitus, hearing loss, and alterations of facial, orbital or neck symmetry. None of these signs or symptoms are necessarily of themselves diagnostic. All of them demand careful study and correct interpretation if accurate diagnosis is to result in recovery and preservation of function. Resourcefulness becomes a matter of split-second timing and common-sense response when

the urgency of the moment requires it. Avoidance of surgical misadventures (accidents and complications) is accomplished by careful planning and readiness to meet every anticipated need.

Such axioms as "prejudice is a great time saver; it enables one to form opinions without getting the facts" or "diagnosis by intuition is a rapid method of reaching a wrong solution" express very well the rocky road of misadventure which lies ahead for the patient's diagnosis and management, to say nothing of the creation of unreasoning fears due to misinterpretation and misinformation. Kodachrome photography is admirably suited to demonstrate the vulnerability of the head and neck areas to erroneous approaches in diagnosis and treatment.

COURSE 461

Room 744 Period T-3 or W-3

JULIUS LEMPERT, M.D.
New York

Temporal Bone Surgery: Pitfalls and Problems

Safest methods of exposing to view the surgical anatomy during the performance of temporal bone surgery will be demonstrated. The functional considerations which must be given to the surgical anatomy involved in performing various surgical procedures on the temporal bone will be discussed.

COURSE 462

Room 743 Period W-2

MARK H. LEPPER, M.D.
Chicago
BY INVITATION

Antibiotics in Otolaryngology

The use of antibiotics in terms of the known pharmacology, their effects on microbes and the nature of the disease processes will be considered. Thus, the course will include a consideration of the host-parasite, host-drug and drug-parasite relationships, and from these concepts discussion of the following problems will be developed:

1. When should one treat empirically?
2. Estimation of effectiveness of the drug
3. Bacteriologic studies required
4. Are sensitivity studies helpful?
5. What is optimal treatment?
6. When should antibiotics be changed?
7. What are the rules governing the choice of drugs when changes are made?
8. What are the reasons for failure?
9. Drug toxicity and differential diagnosis

COURSE 463

Room 706 Period W-2

ROBERT B. LEWY, M.D.
Chicago

Self-Retaining and Gear-Powered Direct Laryngoscopy

This course will consist of instruction in the chest-suspension type of direct laryngoscopy. It will involve use of a leverage holder with standard laryngoscopes and modified Lynch equipment. Some slides of photographs of laryngeal lesions will also be shown. New simplified positions which do not require head holders have been developed and will be presented.

COURSE 464

Room 743 Period T-3

LOUIS R. LIMARZI, M.D.
Chicago
BY INVITATION

Blood Disturbances and Their Relationship to Otolaryngology

The course will include consideration of the changes produced on the tongue and mucous membranes by the anemias, and a simplified classification of the anemias, leukemias and hemorrhagic diatheses. The otolaryngologic complica-

tions from leukemia and other myeloproliferative diseases and their management in relation to the over-all care of the patient will be discussed. Hemorrhagic diatheses, e.g., thrombocytopenia, and coagulation and vascular defects will be stressed in the management of patients with epistaxis and other bleeding phenomena.

COURSE 465

Room 743 — Period W-3

WALTER E. LOCH, M.D.
Baltimore
BY INVITATION

Septum Deviations: Techniques of Surgical Correction

The technique for reconstruction of the nasal septum for varying degrees of deviations, obstructions, and impactions will be described. The surgical anatomy of the septum and its related structures will be discussed with special reference to its influence on the technical procedure and avoidance of possible infavorable sequelae. The septal reflections will be illustrated, and their significance in the surgical procedure will be mentioned.

COURSE 466

Room 734 — Period W-3

JOSEPH LUBART, M.D.
New York

Surgical and Biochemical Complications in the Rhinoplasty Operation

1. Complications that are likely to yield to surgery
2. Complications requiring a biochemical approach

Both of these may be divided into the following categories:

a. Complications at time of operation
b. Complications occurring in the early postoperative period
c. Complications appearing in the late postoperative period

Each category will be discussed in detail and illustrated with slides.

COURSE 467

Room 777 or Room 738 — Period W-2 or Period Th-3

MERCER G. LYNCH, M.D.
New Orleans

Suspension Laryngoscopy and Intralaryngeal Surgery

The course will deal with a brief description of the apparatus, including the suspension laryngoscope, as well as the suspension hook. In the description of the apparatus, special attention will be paid to the assemblage of the parts and to the function of each part in facilitating ease of operation. The discussion of the use of the instrument and its application will also include the type of anesthesia best suited for use in suspension laryngoscopy and the advantages and disadvantages of various anesthetics.

The last half of the period will deal with the technique of intralaryngeal surgery, including removal of benign and malignant lesions, removal of scars and webs, plastic procedures of the larynx, and the Thornel operation.

COURSE 468

Room 744 — Period Th-1

JAMES H. MAXWELL, M.D.
Ann Arbor, Mich.

Tumors of the Parotid Glands

The subject matter of this course includes the differential diagnosis and treatment of some of the more common inflammatory and neoplastic tumors of the parotid glands.

The technique and the objectives of sialography will be discussed.

A classification of neoplasms of the parotid gland will be given, and an attempt will be made to base the surgical treatment of these tumors on their histopathologic types.

Time will be allowed for free discussion at the end of the period.

COURSE 469

Room 738 Period W-3

FRANCIS H. McGOVERN, M.D.
Danville, Va.

Diseases of the Facial Nerve: Medical and Surgical Management

Recent advances in anatomic concepts, diagnostic procedures, and medical and surgical management of diseases affecting the facial nerve have attracted the interest of otolaryngologists in America and abroad in recent years. Facial paralysis still constitutes a challenging otologic complication; the indications for surgical intervention are now more clearly defined. The medical and surgical treatment of Bell's palsy is in the province of otolaryngology. A broad review of anatomy of the facial nerve and the differential diagnosis of diseases affecting it will be made by diagrams and illustrative cases, and the currently accepted methods of treatment will be outlined.

COURSE 470

Room 738 Period Th-1

JAMES W. McLAURIN, M.D.
Baton Rouge, La.

Treatment of External Otitis

The condition which is generally termed otitis externa is actually not a single clinical entity but a number of different diseases, tied together only by the fact that they are all infections and are all located in the external ear. If otitis externa is a group of diseases, rather than a single disease, no single specific treatment can be expected to be effective for them all. In the discussion of therapy, therefore, we will be concerned with general principles first and with specific agents second. Finally, methods of treatment will be reviewed and their rationale discussed.

COURSE 471

Room 743 Period T-2
or or
Room 706 Period W-1

BERNARD J. McMAHON, M.D.
Clayton, Mo.

Treatment of Sinusitis—Then and Now

The following aspects will be discussed:

1. A critical review of diagnostic procedures and of topical medical and surgical procedures of the past thirty years, passing from the radical to the conservative eras
2. The influence of increased knowledge of the pathology and physiology of the nose and paranasal sinuses
3. The role played by chemotherapeutic and antibiotic measures

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COURSE 472

Room 752 Period W-1 or Th-1

WILLIAM J. McNALLY, M.D.
Montreal, Que., Canada

Labyrinthine Tests

This course is designed to present the basic or elementary facts which are necessary for an understanding of clinical labyrinthine tests. Much of the time will be taken up in studying the actual methods used in carrying out the various tests. Time will also be given to working out the interpretation of reactions which follow the simple tests. The simplicity of the tests will be stressed. As a brief introduction, the anatomy and physiology of the semicircular canals and the otoliths will be reviewed. The examination of spontaneous phenomena will be considered. Guides for the detection of spontaneous nystagmus will be given. An interpretation of past-pointing tests and their relation to vestibular stimulation will be studied. The technique of performing the caloric and rotation tests will be taken up in detail. The rules which govern labyrinthine reactions will be used to interpret the results of these tests. Finally, the significance of the results of the tests in labyrinthine and intracranial diagnosis will be investigated.

COURSE 473

Room 740 Period T-3

SYLVESTER C. MISSAL, M.D.
Cleveland

Skin Testing: Modern Technique

Skin testing continues to maintain an important role in the diagnosis and treat-

ment of nasal allergy. It is of the greatest value in inhalant allergy. When food is a factor, the results are less reliable. Problems involved in skin testing as they apply to an otolaryngic practice will be discussed.

A practical method of doing intradermal and scratch tests of sensitivity to foods and inhalants will be demonstrated. The comparative value of various methods will be discussed. The modern technique of utilizing skin reactions as a guide to therapy will be illustrated. Case material will be presented.

COURSE 474

Room 740 Period T-1 or W-1

LEWIS E. MORRISON, M.D.
Indianapolis

Children's Injuries

As a physician, the rhinologist is responsible for the care of all injuries which his patient may have suffered. The problem of anesthesia in children will be discussed. Diagnosis and analysis of the amount of injury will be covered by referring back to basic anatomy. Consequences and sequelae of injury will be touched upon. Preparation of the patient for surgical operation and preparation of the operating room for the patient are important. The repair of injuries is merely the re-placement of the disturbed elements into the normal relationship.

COURSE 475

Room 740 Period T-2

DAVID MYERS, M.D.
Philadelphia

Surgery of Chronic Otitis Media

During the past few years there has been a marked change in the treatment of chronic otitis and its sequelae. This is an evolutionary change brought about by the availability of antibiotic therapy, increasing knowledge of the physiology of the conductive mechanism of the middle ear, and the improvement in otologic surgical technique and equipment.

In dealing with chronic otitis there are two types of cases: (1) persistent otorrhea and deafness and (2) the dry, healed ear with deafness the result of perforation, adhesive processes, or previous mastoid surgery.

The lecture will cover the historical events, diagnostic techniques, choice of surgical procedures and the tympanoplastic and prosthetic techniques employed. It will be illustrated by slides, case reports and audiograms.

COURSE 476

Room 752 Period T-3

HARRY NEIVERT, M.D.
New York

Surgery of the Bony Nasal Vault: Principles and Mechanics

Some new principles in the surgery of the bony bridge and the mechanics necessary to attain better results with less trauma, greater ease and speed will be discussed.

We shall explain the lack of union at the dorsum resulting in gaps in the bony bridge; causes of irregular thickening under the skin; why the bony bridge broadens and sinks lower than anticipated, making the cartilaginous bridge too prominent; why outfracturing with a wide chisel should give better results with less comminution than infracture with fingers; why I leave and preserve intact all periosteum, no matter how large the hump.

We shall demonstrate the proper use of new instruments for elevating the periosteum as one sheath; doing the osteotomy without elevating the periosteum and soft tissues, thereby lessening the extent of postoperative ecchymosis and swelling; making the desired greenstick fracture without cutting the soft tissues on the nasal side of the bridge; how to use a narrow chisel and get a straight line for the osteotomy; how to prevent the nonunion at the dorsum of the two sides of the nasal bridge; how to prevent the sinking of the bridge, and many other problems.

COURSE 477

Room 740 Period W-2 or Th-2

CHARLES M. NORRIS, M.D.
Philadelphia

Partial Laryngectomy: Techniques

A review, based on current experience at the Chevalier Jackson Clinic, of present techniques for surgical treatment of cancer of the larynx in instances where adequate removal may be accomplished without total laryngectomy. Principles of surgical treatment will be discussed and details of technique illustrated in relation to criteria for selection of each of the several "conservative" procedures. The use of foam-rubber and acrylic molds and skin grafting will be included.

COURSE 478

Room 744 Period Th-2

JOSEPH H. OGURA, M.D.
St. Louis

Laryngectomy and Neck Dissection: Transhyoid Pharyngotomy and Neck Dissection

Most malignant lesions classified as endolaryngeal, subglottic or extrinsic should be handled by laryngectomy and radical neck dissection. However, certain forms of extrinsic carcinoma can be handled by the transhyoid approach combined with radical neck dissection. In the latter form, primary closure with skin graft and preservation of the true cord function can be accomplished in one operation.

Selection of cases and technique used will be shown by lantern slides and motion picture.

COURSE 479

Room 744 Period T-2

JOSEPH H. OGURA, M.D.
St. Louis

IRVIN M. BIRENBOIM, M.D.
Kansas City, Mo.

Roentgenography of the Head and Neck: New Diagnostic Methods

The aims of the course are to familiarize those attending with the common techniques for roentgenography and to introduce several new methods for illustrating the sinus and laryngeal lesions more clearly.

Schematic transparencies will be shown illustrating positions and superimpositions of anatomic structures. Black-and-white slides and color transparencies of pathologic changes in the sinuses and larynges will also be shown.

The pitfalls of diagnosis will be pointed out.

COURSE 480

Room 752 Period W-3

PETER N. PASTORE, M.D.
Richmond, Va.

Lump in the Throat and Pharyngeal Reflexes

For centuries the complaint of "a lump in the throat" has been synonymous with the diagnosis of "globus hystericus." Fortunately, many physicians have not complacently accepted this as a logical conclusion in every instance.

The discoveries and writings of the past twenty-five years have disclosed multiple causes contributing to the symptom and related sensations previously classified as neurotic in type.

Of all specialists, the otolaryngologist should be most fully aware of the many recent developments and observations, particularly those related to previously neglected pharyngeal reflexes and their manifestations.

Over twenty functional conditions causing the sensation "a lump in the throat" will be reviewed. Comments regarding the mechanism, diagnosis and treatment of the symptoms will be supplemented by illustrations and a discussion of the nerve pathways thought to be involved.

COURSE 481

Room 752 Period Th-2

SAMUEL J. PEARLMAN, M.D.
Chicago

Important and Annoying Ear, Nose and Throat Complaints in Old Age

While there are few specific diseases of the aged, there are conditions present in

all ages which in later life are often annoying and persistent, and tend on occasion to be unendurable.

A partial catalog may run as follows: dry mouth, burning tongue, postnasal drip, fissures about the corners of the mouth and in the nasal vestibuli, early carcinoma of the pharynx, leukoplakia, crusting conditions in the nose including atrophic rhinitis, itching ears, head noises, vertigo, and senile deafness. An attempt will be made to point out the important features of these complaints and to indicate, when possible, satisfactory modes of treatment.

COURSE 482

Room 752 Period W-2

HENRY B. PERLMAN, M.D.
Chicago

Fluid in the Middle Ear: Etiology and Management

Different kinds of fluid may be found in the middle ear and adjacent air cells. Each kind is associated with a particular pathogenesis. A clear understanding of the normal and pathologic physiology of the eustachian tube is essential to the interpretation of this group of ear diseases. The recognition of their more subtle changes and their relation to deafness is sometimes difficult. Careful observation of the natural course of the various disease states is also important in understanding indications and prospects of therapy. Experience with some unusual cases seen during the past few years will be reviewed. A motion picture will be presented.

COURSE 483

Room 752 Period Th-3

ARTHUR W. PROETZ, M.D.
St. Louis

Nasal Health and Air Conditioning

There are five kinds of air conditioning: one good and four bad. Extremes of weather are unhealthy, but in most habitable places they are transient. When the man-made variety of weather incorporates one of these extremes, in constant operation, individuals subjected to it eventually, or even presently, develop symptoms referable to it.

Doctors should recognize these symptoms for what they are and should accompany treatment with the removal of the cause, if any progress is to be made.

The present course will deal with (1) the local effects of faulty air conditioning, (2) the elements and capacities of proper mechanical equipment, and (3) an evaluation of apparatus now in use, with special reference to living quarters, bedrooms and sickrooms.

Effective local treatment will be outlined.

COURSE 484

Room 752 Period T-1

WILLIAM F. RABBETT, M.D.
New York

RICHARD J. BELLUCCI, M.D.
New York

Submucous Resection of the Nasal Septum

Surgical anatomy of the nasal septum and framework of the external nose will be reviewed.

A simplified technique for the surgical correction of the deviated nasal septum, as taught at the Manhattan Eye, Ear, and Throat Hospital, will be presented.

Surgical management of the anterior deviated nasal septum with obstruction of the nares will be considered.

The relative importance of the septum in plastic surgery of the nose will be discussed.

COURSE 485

Room 752 Period T-2

SCOTT N. REGER, Ph.D.
Iowa City, Iowa

Practical Office Audiometry

This course will comprise (1) the common sources of error in audiometry; (2) an adequate testing procedure; (3) the

use of masking while obtaining air and bone conduction measurements; and (4) interpretation of audiograms.

COURSE 486

Room 744 Period W-2

HERBERT J. RINKEL, M.D.
Kansas City, Mo.
BY INVITATION

Food Allergy in Otolaryngologic Practice

I. History Taking. A resume of the cardinal symptomatic patterns which indicate the possible existence of food allergy, together with cross questions to either repudiate or substantiate this possibility.

II. Diagnostic Methods. A survey of the relative accuracy of skin tests, feeding tests, diet charts, and clinical studies.

III. Therapeutic Procedures for Food-Sensitive Patients. A resume of the clinical handling, advice, information, and procedures to be followed to improve the patient who is food sensitive. Particular stress will be placed on those features which the busy practitioner can use when space and assistance are limited.

COURSE 487

Room 750 Period T-1

BERNARD J. RONIS, M.D.
Philadelphia

Sinus Surgery: Modern Indications and Techniques

In the majority of patients with subacute or chronic infection of the sinuses, clinical cure can be effected by conservative measures. The role of the otolaryngologist as a surgeon is still important. Good clinical results will be obtained by the use of antibiotics and concepts of the reversibility of tissue changes wrought by allergy. When surgical intervention is necessary, conservative procedures should be considered first. Extensive surgical procedures are necessary in those instances in which the more conservative measures have not resulted in clinical cure or in which benign invasive or malignant tumors of the sinuses are present.

A presentation will be made with the present-day indications for sinus surgery and techniques of modern surgical procedures. A clinical evaluation of end results in a varied group of patients will be reviewed.

COURSE 488

Room 750 Period T-2

ROBERT E. RYAN, M.D.
St. Louis

Headache: Differential Diagnosis and Treatment

The differential diagnosis and the treatment of various types of headache will be presented. Among types of headache to be discussed are migraine, histaminic cephalalgia, sinusitis, myalgia, tension headache, psychogenic headache, hypertensive headache, post-traumatic headache, and ocular or otic headache, as well as the mixed type.

Various new preparations for treating headache patients will be discussed and the results of treatment demonstrated. Many of these drugs are still in the investigative stage, while others have been on the market for only a short period of time. The prophylactic and the symptomatic phases of the various types of headache will be discussed.

Techniques for recording the history of the headache patient and for routine examination will be outlined.

COURSE 489

Room 750 Period T-3

MAX SAMTER, M.D.
Chicago
BY INVITATION

Steroids in Otolaryngology

The conference will consist of three sections:

1. A presentation of basic principles which govern the use of ACTH and corticosteroids in man

2. A discussion of the changes in eye, ear, nose and throat which suggest administration of the hormones; and a review of danger signs and contraindications

3. A question period which will attempt to analyze specific therapeutic problems submitted by members of the audience

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COURSE 490

Room 750 Period Th-1

LYLE M. SELLERS, M.D.
Dallas

The Office Practice of Otolaryngology

Here are the procedures found by thirty-five years' experience to be most effective in the office practice of otolaryngology. The course will begin with the introduction of the patient to proper office procedures by the receptionist. It will continue with methods of keeping records, both professional and business; the putting of the patient at ease in the presence of a strange and perhaps awesome environment; the dealing with the patient as a sick and frightened human being; the successful approach to and the human handling of children; the technical procedures that have proved to be of most value in the ordinary as well as the unusual medical problems.

It will also consider the office equipment and how to keep it modern and workable without the extravagant purchases of new gadgets that prove to have little or no value except for the passing moment. In short, how best to conduct yourself and your office that out of your practice will come that which will be of lasting benefit to your patients and to yourself.

COURSE 491

Room 750 Period W-1

LYLE M. SELLERS, M.D.
Dallas

The Successful Management of Acute and Chronic Infectious Frontal Sinusitis

Real sinus infections are still problems to be faced. All is not allergy, and all types of infections do not yield to "miracle" drugs. The frontal sinus poses particular problems because of its anatomy and because of many divergent views of the proper methods of dealing with them.

This course will deal with the methods of solving these various problems which have proved to be successful in many years of use. The exact problems posed and the procedures used will be described in detail and will be illustrated fully by slides, dissections and the demonstration of operative procedures on these specimens, and they will be documented by illustrative actual case histories.

COURSE 492

Room 743 Period Th-2

BEN H. SENTURIA, M.D.
St. Louis

Diseases of External Ear: New Developments in Treatment

A review of recent studies and experiments relating to the cause and treatment of diseases involving the external ear will be presented. This will include consideration of the various factors involved in the development of external otitis. The indications and contraindications for the use of antibiotics and corticoids will be discussed.

COURSE 493

Room 776 Period W-1
or or
Room 734 Period Th-3

GEORGE E. SHAMBAUGH, JR., M.D.
Chicago

Otosclerosis: Selection of Therapy

A critical evaluation of fenestration versus stapes mobilization as the operation of choice in cases of otosclerosis will be based on published reports and accumulated experience.

The preoperative tests required to advise a patient regarding elective surgery for otosclerosis and the interpretation of these tests will be described, including

the predictive formula and the pertinent information which should be supplied a patient to enable him to choose between surgery and a hearing aid.

COURSE 494

Room 728 Period Th-3

MARVIN W. SIMMONS, M.D.
Fresno, Calif.

Problem of the Bleeding Patient

Bleeding from the nose, postoperative tonsil and adenoid bleeding, and bronchial and esophageal hemorrhage may be sources of considerable difficulty for the otolaryngologist.

An understanding of the basic principles of coagulation, hematologic cause for the bleeding, blood tests, and the need for transfusions and when to give them will help materially to alleviate anxiety.

COURSE 495

Room 750 Period W-2 or Th-2

KINSEY M. SIMONTON, M.D.
Rochester, Minn.

Nasal Polyps: The Definitive Surgical Treatment

The high incidence of recurrence of nasal polyps after surgical removal results from the nature of polyps and the pathologic physiology created by nasal and sinal obstruction. The polypoid nose possesses poor resistance to infection. Chronic sinusitis accompanying polyposis promotes rapid recurrence of polyps. The definitive surgical treatment of nasal polyps has three basic aims: (1) removal of polypoid mucosa within the sinuses as well as within the nose, (2) removal of potential polyp-forming mucosa from the sinuses, particularly the ethmoid labyrinth, and (3) provision of free drainage from the sinuses. The results of this approach to the problem justify the procedure in properly selected cases.

COURSE 496

Room 750 Period W-3

EMANUEL M. SKOLNIK, M.D.
Chicago

Electrodiagnosis of Disease of the Facial Nerve

Electrodiagnosis is an adjunct to accurate diagnosis of neuromuscular disease. While it is a very valuable diagnostic aid, it does not relieve the clinician of diagnostic responsibility. The reaction of degeneration (R.D.) test is a good screening test; its limitations must be understood. Electromyograms (EMG) gives the most basic information and, after a screening test has been performed, provide information of great value in diagnosis, prognosis, and evaluation of effectiveness of therapy. Practical interpretation of the R.D. and EMG will be stressed. The mechanics of testing will be presented.

COURSE 497

Room 740 Period W-3

WAYNE B. SLAUGHTER, M.D.
Chicago
BY INVITATION

Unilateral Tonsillectomy: Indications and End Results

Presentation of a ten-year study of unilateral tonsillectomies. The relationship to related anatomic structures will be considered. Of prime importance is the change in related lymphoid tissue. Indications and contraindications will be pointed out in a short colored motion picture on the subject. Anatomical drawings and photographs will be utilized to demonstrate technical points.

COURSE 498

Room 740 Period Th-3

WAYNE B. SLAUGHTER, M.D.
Chicago
BY INVITATION

Facial Fractures

A series of 100 colored slides will be used to show techniques for stabilization of fractures of the facial bones. Steps

showing methods of treatment, progression from simple lower jaw fractures to complex, compound facial fractures will be demonstrated. Emphasis is placed at all times on utilization of physiologic forces rather than gadgets to maintain stability.

COURSE 499

Room 738 Period Th-2

MAURICE F. SNITMAN, M.D.
Maywood, Ill.

ARTHUR LOEWY, M.D.
Chicago

Surgery of the Neck: Fundamental Principles

The basic structure of the neck will be reviewed to emphasize true, living surgical anatomy in contrast to artefacts of cadaver material. Surgical features which depend upon an appreciation of the living anatomical conditions will be stressed. Details of preparation of the patient and of the operative field that have facilitated surgical procedures will be demonstrated. Instrument techniques which have shortened operative time and increased safety of neck surgery will be shown. Slides, demonstrations and tissue materials will be used to illustrate and emphasize these features.

COURSE 500

Room 727 Period Th-2

MAX L. SOM, M.D.
New York

Hemilaryngectomy for Cordal Carcinoma with Extension Posteriorly

Hemilaryngectomy is reserved for cases of cordal carcinoma with extension posteriorly onto the vocal process of the arytenoid or laterally into the ventricle. Local excision by thyrotomy and cordectomy has proved inadequate. However, hemilaryngectomy makes possible the total removal of the carcinoma with a wide margin of normal tissue. The surgical specimen includes the carcinoma with both the true and false cord and the arytenoid in continuity with the alae of the thyroid cartilage on the involved side. The defect created by this wide excision is covered by the preserved mucosa of the aryepiglottic fold and the pyriform fossa. The larynx is thus preserved and there has been no difficulty with laryngeal stenosis or swallowing. A five-year follow-up, in selected cases, has shown very favorable results.

COURSE 501

Room 776 Period T-1

OLIVER W. SUEHS, M.D.
Austin, Texas

Secretory Otitis Media: Etiology, Diagnosis and Management

Secretory otitis media is one of the most important and often most perplexing otologic problems in office practice today. It is the most common cause of hearing loss in children and is therefore a condition that we must be able to recognize and treat adequately if we are to prevent chronic adhesive otitis media with its resultant permanent hearing impairment.

This course will include a discussion of the incidence of this disease, the anatomical considerations that are of importance in its pathogenesis, and a brief review of its pathology. The various causes of secretory otitis media will be reviewed, with particular attention to local and systemic conditions that contribute toward recurrence and chronicity.

The office management of acute and chronic secretory otitis media in adults and children will be covered, calling attention to the importance of arriving at a correct etiologic diagnosis and treating the underlying cause. The results of treating recurrent and chronic secretory otitis media in children by external irradiation and by adenoidectomy will be discussed.

COURSE 502

Room 776 Period T-2

HAROLD G. TABB, M.D.
New Orleans

Maxillectomy: Surgical Technique

This course will describe in detail the steps in a surgical resection of the maxillary antrum for carcinoma, with and

without inclusion of the orbital contents. Discussion will also be centered on making an early diagnosis in cancer of the antrum, the type of management required, merits of hypotensive anesthesia, the use of supplemental irradiation, postoperative care and rehabilitation of the patient. The procedure will be demonstrated and illustrative cases shown on kodachrome slides.

COURSE 503

Room 776 Period T-3

JUAN MANUEL TATO, M.D.
Buenos Aires, Argentina
BY INVITATION

Tympanoplasty: The Importance of Functional Examination

This course deals with the preoperative determination of hearing loss related to the pathology of the tympanic transmission apparatus. The methods used and results obtained are important for diagnosis and for selection of an adequate type of surgical correction. Tests of the function of the vestibule and chorda tympani are less important in this regard. The anatomic findings during the operation will be assessed for the reconstruction of the tympanic transmission apparatus.

COURSE 504

Room 776 Period W-3

JUAN MANUEL TATO, M.D.
Buenos Aires, Argentina
BY INVITATION

Tympanoplasty

Tympanoplasty is the functional reconstruction of the tympanic apparatus by surgical procedures. We will deal with the classification of the different types of pathologic-anatomic disturbances of the tympanic apparatus and corresponding surgical techniques directed toward the functional correction of such processes, which include sequelae of otitis media, adhesive processes, and congenital malformations of the external and the middle ear.

Descriptions of different procedures and personal results, as well as those reported in the literature, will be presented.

COURSE 505

Room 740 Period Th-1

JUAN MANUEL TATO, M.D.
Buenos Aires, Argentina
BY INVITATION

External Frontal Sinus Surgery: Osteoplastic Method and Occlusion of the Cavity

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COURSE 506

Room 776 Period W-2
or or
Room 726 Period Th-2

G. EDWARD TREMBLE, M.D.
Montreal, Que., Canada

Practical Therapeutics in Office Practice

In this course a number of common conditions encountered every day by otologists will be discussed.

1. Nasal obstruction due to engorged or hypertrophied inferior turbinates; its treatment
2. Methods of shrinking the posterior tips
3. The conservative treatment of sinusitis in view of our present knowledge
4. A safe and simple method of irrigating the sphenoid sinus. This is important in cases of optic neuritis. A 6-minute motion picture in color will present a few important measurements and instruments used in this procedure
5. The tonsil and adenoid problem, with special reference to the clinical anatomy and treatment of the lingual tonsils
6. If time permits, some practical points will be mentioned about external otitis. Treatment in this condition has changed considerably in the past ten years due to our greater knowledge. The relative merits of the current antibiotics will be described and a number of suggestions given.

COURSE 507

Room 777 or Room 705 — Period T-1 or Period Th-2

O. E. VAN ALYEA, M.D.
Chicago

Sinusitis: Recent Advances in Management

Persistence of a sinus infection implies inadequate drainage. Factors contributing to impairment of drainage may be local or systemic. The local factors may be structural or pathologic, and in some cases the sinusitis is maintained by a combination of contributing causes.

The goal of the rhinologist is to eliminate the causative factors while treating the infection.

Seldom is the radical removal of sinus mucosa in the treatment of sinusitis indicated, and it should be undertaken with the understanding that only temporary relief may be expected and that a return of the symptoms, even more pronounced than formerly, may ensue.

In this course the techniques of various therapeutic measures used successfully in the management of sinus disease will be discussed in detail.

COURSE 508

Room 716 — Period Th-1

DELMAR F. WEAVER, M.D.
Detroit

Tumors of the Face: Management

A variety of benign and malignant tumors of the face will be illustrated by kodachrome slides. The methods of surgical treatment used on these tumors and the reconstruction of postoperative defects will be discussed and illustrated in some detail. Treatment includes simple excision and electrocoagulation of small tumors as well as more extensive procedures requiring removal of bone or cartilage in the regions of the frontal and maxillary sinuses, the mastoids, the nose and ears.

Reconstructive procedures include free skin graft, adjacent flaps, pedicle flaps from the forehead, and tubed pedicle flaps from the clavicular region.

COURSE 509

Room 777 — Period W-1

RUSSELL I. WILLIAMS, M.D.
Cheyenne, Wyoming

Surgical Exposure of Base of Nose, Maxillary Spine and Pyriform Aperture

Adequate exposure of the base of the nose is necessary for handling problems of the caudal end of the nasal septum. This will include a brief description of the anatomic relationship of the caudal end of the nasal septum to the anterior maxillary spine, the pyriform aperture and the premaxilla. Techniques for exposure and methods of handling the various malformations in this area will be discussed. Various techniques for the repair of septal perforations will be briefly described.

COURSE 510

Room 726 — Period W-1 or Th-1

SIDNEY K. WYNN, M.D.
Milwaukee

External Nasal Growths: Removal and Primary Plastic Reconstruction

The removal of external nasal growths may vary from simple excision of the growth with a primary closure involving local tissue to an extensive removal of a growth with the use of skin grafts or flaps.

In the lower one third of the nose, the close attachment of the skin of the underlying alar cartilages poses problems which make removal more difficult. Directions of lines of excision and methods of removal of various types of growths will be demonstrated. The use of the split-thickness skin graft, the use of the full-thickness skin graft, and the use of the actual flap for closure of defects will be discussed. Individual problems, such as the excision of dermoid cysts of the nose, excision of carcinomatous types of growths, the trimming of the alar cartilages in order to form greater relaxation of the overlying skin, and the injection and surgical therapy for hemangiomas of the nose, will be discussed.

COURSE 511

Room 711 Period Th-1

MUSTAFA KEMAL YON, M.D.
Chicago
BY INVITATION

1. General introduction of the immediate postoperative (recovery-room) care after anesthesia
2. Prevention of any damage to the eye
   a. Chemical
   b. Traumatic
   c. Self-inflicted
3. Recognition of complications
   a. Hemorrhage
   b. Dehiscence of the surgical wound
4. Specific problems and routines in eye care
   a. Extraocular surgery
   b. Intraocular surgery
   c. Eye injuries
5. Recovery-room care of the patient
   a. General care
   b. Special care
   c. Complications
   d. Emergencies
6. Routine equipment in the recovery room

The following are condensed schedules of courses previously described

CONTINUOUS COURSES — OPHTHALMOLOGY

COURSE	SPEAKERS	SUBJECT	PERIODS USED
1	Adler	Physiology of Vision	3 PERIODS M-4, T-4, W-4
2	Allen et al.	Bacteriology and Infectious Diseases	8 PERIODS M-4, M-5, T-4, T-5 W-4, W-5, Th-4, Th-5
3	Ascher	Aqueous Veins in Glaucoma	2 PERIODS M-4, M-5
4	Ballintine & Johnson, L.	Clinical Tonography	2 PERIODS M-5, M-6
5	Becker & Kinsey	Studies on Aqueous Flow	2 PERIODS T-5, T-6
6	Bedell	Medical Ophthalmoscopy	3 PERIODS M-4, T-4, W-4
7	Berke	Surgery of Oblique Muscles	2 PERIODS M-5, M-6
8	Berliner	Recent Advances in Biomicroscopy	3 PERIODS M-6, T-6, W-6
9	Birge et al.	Vascular Diseases	2 PERIODS T-5, T-6
10	Boeder	Practical Optics	2 PERIODS M-5, M-6
11	Breinin	Electromyography	2 PERIODS W-5, W-6
12	Brockhurst	Indirect Ophthalmoscopy	2 PERIODS T-5, T-6
13	Brown, H. et al.	Eye Muscles	8 PERIODS M-4, M-5, T-4, T-5 W-4, W-5, Th-4, Th-5
14	Byrnes	Ophthalmic Filters	2 PERIODS W-5, W-6
15	Callahan et al.	Ophthalmic Plastic Surgery: Fundamental	8 PERIODS M-5, M-6, T-5, T-6 W-5, W-6, Th-5, Th-6
16	Clark, G.	Retinal Detachment	3 PERIODS M-4, T-4, W-4
17	Clark, W.	Surgery of Ocular Muscles	2 PERIODS M-4, M-5
18	Clark, W.	Cataract Extraction: Selection of Patient	2 PERIODS T-4, T-5
19 or 20	Copeland	Streak Retinoscopy	4 PERIODS M-4, M-5, T-4, T-5 or W-4, W-5, Th-4, Th-5
21	Costenbader et al.	Comitant Strabismus	12 PERIODS M-4, M-5, M-6, T-4 T-5, T-6, W-4, W-5 W-6, Th-4, Th-5, Th-6
22	Dunnington & Regan, E.	Cataract Surgery: Complications Due to Defective Wound Healing	2 PERIODS M-4, M-5
23	Fonda & Sloan	Subnormal Vision	2 PERIODS T-4, T-5
24	Guibor	Orthoptics: Office and Home Techniques	3 PERIODS M-4, T-4, W-4
25	Hollenhorst	Arterial Diseases	2 PERIODS M-4, M-5
26	Hughes et al.	Ophthalmic Plastic Surgery: Advanced	8 PERIODS M-5, M-6, T-5, T-6 W-5, W-6, Th-5, Th-6

CONTINUOUS COURSES — OPHTHALMOLOGY

COURSE	SPEAKERS	SUBJECT	PERIODS USED
27	Knighton et al.	Highlights in Glaucoma	8 PERIODS M-4, M-5, T-4, T-5 W-4, W-5, Th-4, Th-5
28	McLean et al.	Retinal Detachment	8 PERIODS M-4, M-5, T-4, T-5 W-4, W-5, Th-4, Th-5
29	Pfeiffer & Jones, I.	Roentgenography of the Eye and Orbit	2 PERIODS M-4, M-5
30	Pischel et al.	Retinal Detachment	4 PERIODS M-5, M-6, T-5, T-6
31	Regan, J. & Regan, C.	Refraction: Practical Aspects & Aids in Difficult Problems	6 PERIODS M-4, M-5, T-4, T-5 W-4, W-5
32	Rolett	Gonioscopy: Practical Application	2 PERIODS W-4, W-5
33	Romaine	Ocular Motility Surgery	4 PERIODS M-4, M-5, T-4, T-5
34	Romaine	Refraction Problems: Treatment	3 PERIODS M-6, T-6, W-6
35	Rucker	Neuro-ophthalmology	3 PERIODS M-6, T-6, W-6
36	Schimek & Bousquet	Clinical Gonioscopy & Tonography	2 PERIODS W-5, W-6
37	Sloane	School Vision Testing	2 PERIODS M-4, M-5
38	Sloane	Telescopic Lenses	2 PERIODS T-4, T-5
39	Gettes	Prescription of Prisms; Drugs in Refraction	2 PERIODS W-4, W-5
40	Steffensen & Smith, R.	Corticotropin and Synthetic Steroids	2 PERIODS T-4, T-5
41	Stow & Moss	Diagnostic & Therapeutic Office Procedures	2 PERIODS M-5, M-6
42	Theobald et al.	Histopathology	12 PERIODS M-4, M-5, M-6, T-4 T-5, T-6, W-4, W-5 W-6, Th-4, Th-5, Th-6
43	Thorpe	Surgery of Intraocular Foreign Bodies	2 PERIODS M-4, M-5
44	Thorpe et al.	Slit Lamp Biomicroscopy: Fundamentals	9 PERIODS M-4, M-5, M-6, T-4, T-5 T-6, W-4, W-5, W-6
45	Thorpe et al.	Slit Lamp Biomicroscopy: Advanced	3 PERIODS Th-4, Th-5, Th-6
46	Thorpe et al.	Slit Lamp Gonioscopy	6 PERIODS T-4, T-5, T-6, W-4 W-5, W-6
47	Townes	Cataract Surgery: Complications	2 PERIODS W-5, W-6
48	Troutman et al.	Recent Advances in Ophthalmology	8 PERIODS M-5, M-6, T-5, T-6 W-5, W-6, Th-5, Th-6
49	Troutman	Enucleation Surgery	2 PERIODS T-4, T-5
50	Wheeler & Knapp	Concomitant Strabismus	6 PERIODS M-4, M-5, T-4, T-5 W-4, W-5
51	Home Study		10 PERIODS M-4, M-5, M-6, T-4, T-5 T-6, W-4, W-5, W-6, Th-4

SCHEDULE OF INDIVIDUAL COURSES — OPHTHALMOLOGY — Monday

Key M-4 — 2:00 p.m. to 3:00 p.m.

Course No.	SPEAKER	SUBJECT
101	Aldrich	Emotional Problems in the Ophthalmologist's Patients
102	Alfano	Angiography
104	Alvaro	Uveitis: Etiology and Treatment
108	Bannon	Aniseikonia: Its Role in Refractive Problems
111	Berens	Ophthalmic Surgery: New Procedures
112	Bettman	Radioactive Isotopes
116	Bonner	Vascular Retinopathy
123	Chamberlain	Vertical Motor Anomalies
126	Cholst	Central Fields
127	Cohoe	Special Reading Instructions for the Partially Seeing
135	Cutler	Cataract: Methods of Extraction
138	Davis	Sutures in Cataract Surgery
156	Gifford	Local Anesthesia
168	Hogan	Lesions of the Choroid
224	Payne	Extraction of Complicated Cataract
251	Tassman	Retinopathy in Diabetes

Key M-5 — 3:15 p.m. to 4:15 p.m.

Course No.	SPEAKER	SUBJECT
103	Allen, H.	Aseptic Technique
107	Baird	Lesions of the Orbit
130	Cordes	Eye Changes in Diabetes
131	Coston	Inflammatory and Degenerative Disease of the Retina
133	Cunningham	Types of Head Pain
137	Davidson	Surgical Instruments: Preparation and Care
141	Diskan	Visual Screening in Schools
154	Gemeroy	External Diseases
178	Katz	Ophthalmic Anatomy
197	Lloyd	Fundus Lesions of the Senile Eye
208	McDonald	Penetrating Wounds of the Eye
217	Myers	Vertical Phorias and Tropias

Key M-6 — 4:30 p.m. to 5:30 p.m.

Course No.	SPEAKER	SUBJECT
105	Alvis	Glaucoma Surgery
106	Amenabar	Retinal Detachment
109	Benedict	Atrophic Changes of the Iris
117	Brown, A.	Fever Therapy vs. Antibiotics and Corticosteroids
118	Calhoun	Epithelization of the Anterior Chamber
119	Carroll	Optic Nerve Lesions
125	Chandler	Cataract Surgery: Complications
136	Daily	Biomicroscopy of Vitreous and Fundus Oculi
139	Day	Medical Exophthalmos
140	DeVoe	Corneal Dystrophies
143	Dunlap	Divergence Anomalies
147	Ferrer	Contact Lenses
152	Gaines	Ophthalmologic Examination from Neuro-ophthalmologic Viewpoint
161	Hanno	Internal Medicine: Ophthalmic Problems
163	Harrington	Dynamics of Phacoerysis
170	Jacobson	Electroretinography
182	Kimura	Chronic Lesions of Anterior Segment
199	Long	Retinoblastoma and the Pseudoretinoblastomas
202	MacLean	Surgical Management of Cataracts
225	Perera	Retinal Detachment
229	Post	Refinements of Refraction
237	Rychener	The Lacrimal Apparatus
246	Solanes	Uveomeningitis Syndromes

SCHEDULE OF INDIVIDUAL COURSES — OPHTHALMOLOGY — Tuesday

Key T-4 — 2:00 p.m. to 3:00 p.m.

Course No.	SPEAKER	SUBJECT
104	Alvaro	Uveitis: Etiology and Treatment
113	Bettman	Value of Goniotomy
121	Cassady	Toxoplasmic Retinochoroiditis
128	Cooper	Principles of Muscle Surgery
129	Cordes	Surgery of Congenital Cataracts
135	Cutler	Cataract: Methods of Extraction
142	Dixon	Indirect Ophthalmoscopy
149	Fralick	Surgical Anatomy in Operations for Glaucoma
150	Fread	Ideal Refraction Equipment
153	Gartner	Fundus Diseases
158	Gump	Recurrent Iridocyclitis
179	Kennedy	Practical Perimetry
188	Leinfelder	Perimetry & Use of Tangent Screen
224	Payne	Extraction of Complicated Cataract
226	Pino & Edwards	Problems in Bifocal Lenses
258	Whalman	Practical Points in Eye Surgery
260	Wood	Central Retinal Lesions

Key T-5 — 3:15 p.m. to 4:15 p.m.

Course No.	SPEAKER	SUBJECT
107	Baird	Lesions of the Orbit
124	Chamlin	Perimetry
145	Falls	Practical Application of Heredity
151	Fry	Lesions at Posterior Pole of Eye
155	Gibson	Retinopathy
157	Gipner	Recent Advances in Ophthalmology
160	Haik	Intracapsular Cataract Extraction
165	Hedges	Neuralgias of the Head
172	Jardon	Fitting Ocular Prostheses
175	Jones, L.	The Lacrimal Drainage System
193	Levy	Motion Picture Photography
207	Maumenee	Surgical Indications for Corneal Procedures
236	Ruedemann	Body Changes Due to Error in Vertical Muscles
255	Veirs	External Dacryocystorhinostomy

Key T-6 — 4:30 p.m. to 5:30 p.m.

Course No.	SPEAKER	SUBJECT
106	Amenabar	Retinal Detachment
110	Berens	Cyclodiathermy, Cycloelectrolysis, Iridencleisis & Cyclodialysis
118	Calhoun	Epithelization of the Anterior Chamber
136	Daily	Biomicroscopy of Vitreous and Fundus Oculi
143	Dunlap	Divergence Anomalies
148	Fink	Binocular Problems in Routine Refraction
167	Hill	Cataract-Surgery
171	Jampolsky	Ocular Divergence
173	Jobe	Practical Optics
176	Joy	Cerebral Angiography
180	Kestenbaum	Reading Aids for Low Vision
181	Keyes	Retinal Vascular Disease
184	Kornzweig	Practical Embryology
187	Leahey	Corneal Transplantation
194	Lewis	External Diseases
222	Osher	Diagnostic Approach to Squint Surgery
225	Perera	Retinal Detachment
237	Rychener	The Lacrimal Apparatus
239	Scheie	Surgery for Congenital Glaucoma
250	Swan	Value of Drugs in Glaucoma
254	Veasey	Refraction Difficulties
256	Weisser	Chronic Uveitis

SCHEDULE OF INDIVIDUAL COURSES — OPHTHALMOLOGY — Wednesday

Key W-4 — 2:00 p.m. to 3:00 p.m.

Course No.	SPEAKER	SUBJECT
120	Cassady	Dacryocystitis and Lacrimal Drainage
134	Cusick	Ptosis
144	Egan	Cross Cylinder: Application and Theory
159	Haas	Congenital Glaucoma
162	Harley	Lesions of 3rd, 4th and 6th Cranial Nerves
166	Henderson	Chiasmal Area Lesions
186	Kronfeld	Choice of Surgical Procedure in Glaucoma
188	Leinfelder	Perimetry & Use of Tangent Screen
192	Lepard	Eye Diseases Common to Children
195	Linksz & Tait	Telescopic & Magnifying Lenses
203	Macnie	Head Trauma with Ocular Symptoms
204	Mangold	Proper Fitting of Glasses
215	Mullen	Ophthalmic Emergencies
227	Pino & Edwards	Correction of Aphakia
234	Roberts	Early Diagnosis of Glaucoma
238	Scarney	Slit Lamp Biomicroscopy
242	Simpson	Convergence Insufficiency and Divergence Excess
249	Stauffer	Allergic Conditions of the Eye
252	Theodore	Ocular Therapeutics
257	Wendland	Chiasmal Lesions
260	Wood	Central Retinal Lesions

Key W-5 — 3:15 p.m. to 4:15 p.m.

Course No.	SPEAKER	SUBJECT
146	Falls	Ocular Geriatrics
157	Gipner	Recent Advances in Ophthalmology
174	Johnson, C.	Ptosis
183	Klien	Clinical Pathology of the Retina
185	Kronenberg	Practical Ocular Therapeutics
189	Lemoine	Vitreous Opacities
191	Leopold	Advances in Ophthalmic Therapy
198	Lloyd	Diseases of the Cornea
200	Lubkin	Psychosomatic Aspects of Ophthalmology
201	Luce	Wound Healing
205	Mann, M.	Hypertensive Vascular Changes in the Fundus
209	McGraw	Contact Lenses
212	Meyer	Surgical Treatment of Glaucoma
214	Morrison	Office Management of Glaucoma
221	Olson	Iritis, Iridocyclitis & Keratitis
247	Spaeth	Plastic Surgery: Practical Aspects
255	Veirs	External Dacryocystorhinostomy

Key W-6 — 4:30 p.m. to 5:30 p.m.

Course No.	SPEAKER	SUBJECT
114	Block	Office Practice of Ophthalmology
122	Castroviejo	Corneal Surgery: Results
140	DeVoe	Corneal Dystrophies
148	Fink	Binocular Problems in Routine Refraction
169	Iliff	Ptosis
180	Kestenbaum	Reading Aids for Low Vision
190	Lennon	Therapy of Acute Inflammatory Glaucoma
194	Lewis	External Diseases
210	McGuire	Cataract: Management of Patient
213	Miller	Corneal Diseases
216	Murrah	Aids for Subnormal Vision
219	Ogle	Stereopsis: Present Concept
223	Paulson	Lighting for Comfortable and Accurate Seeing
228	Posner	Glaucomatocyclitic Crises
230	Prewitt	External Eye Diseases Associated with Allergy
231	Quereau	Physiology of Ocular Movements
232	Randolph	Advanced Glaucoma
233	Rizzuti	Tumors of the Lids and Ocular Adnexa
235	Rudolph & Schlaegel	Chemotherapy
239	Scheie	Surgery for Congenital Glaucoma
241	Shipman	Scleral Resection
244	Smith, B.	Orbital Fractures
259	Wise	Retinal Vascular Disease

SCHEDULE OF INDIVIDUAL COURSES — OPHTHALMOLOGY — Thursday

Key Th-4 — 2:00 p.m. to 3:00 p.m.

Course No.	SPEAKER	SUBJECT
115	Bonaccolto	Enucleation Techniques
120	Cassady	Dacryocystitis and Lacrimal Drainage
132	Cowen	Office Technique for Simplified Gonioscopy
134	Cusick	Ptosis
142	Dixon	Indirect Ophthalmoscopy
159	Haas	Congenital Glaucoma
162	Harley	Lesions of 3rd, 4th & 6th Cranial Nerves
164	Havener	Ocular Melanoma
166	Henderson	Chiasmal Area Lesions
177	Kasper	Dacryocystorhinostomy
185	Kronenberg	Practical Ocular Therapeutics
192	Lepard	Eye Diseases Common to Children
195	Linksz & Tait	Telescopic & Magnifying Lenses
196	Linn	Choice of Glaucoma Operation
203	Macnie	Head Trauma with Ocular Symptoms
211	McGuire	Surgery of Vertical Muscles
215	Mullen	Ophthalmic Emergencies
218	Newell	Refinements in Ophthalmic Surgery
220	Ogle	Binocular Oculomotor Coordination
221	Olson	Iritis, Iridocyclitis & Keratitis
238	Scarney	Slit Lamp Biomicroscopy
240	Schwartz	Eye Changes Associated with Skeletal Disease
243	Simpson	Probing of Nasolacrimal Duct
245	Snydacker	Luxated & Subluxated Lenses
248	Spaeth	Operation for Complicated Ptosis
249	Stauffer	Allergic Conditions of the Eye
252	Theodore	Ocular Therapeutics
253	Vail	Surgery of Senile Cataract

Key Th-5 — 3:15 p.m. to 4:15 p.m.

Course No.	SPEAKER	SUBJECT
183	Klien	Clinical Pathology of the Retina
206	Mann, W.	Functional Visual Impairment
209	McGraw	Contact Lenses
212	Meyer	Surgical Treatment of Glaucoma
214	Morrison	Office Management of Glaucoma

CONTINUOUS COURSES AND PANEL DISCUSSIONS
OTOLARYNGOLOGY

COURSE	SPEAKERS	SUBJECT	PERIODS USED
301	Brewer & Briess	Voice Therapy	2 PERIODS T-1, T-2
302 or 303	Cohen	Nasal Cartilages	2 PERIODS T-2, T-3 or Th-2, Th-3
304 or 305	Conley, Daly & Lenz	Carcinoma of Head & Neck	2 PERIODS T-1, T-2 or W-2, W-3
306	Converse	Nasal Plastic Surgery—Basic	2 PERIODS T-2, T-3
307	Converse	Nasal Plastic Surgery—Advanced	2 PERIODS W-2, W-3
308 or 309	Craft	Nasal Allergy	2 PERIODS T-1, T-2 or W-1, W-2
310 or 311	Fox	Noise in Industry	2 PERIODS W-2, W-3 or Th-2, Th-3
312 or 313	Hansel	Allergy & Medical Otolaryngology	2 PERIODS T-1, T-2 or Th-1, Th-2
314	Harbert	Clinical Audiology	2 PERIODS W-1, W-2
315 or 316	Hardy & Pauls	Clinical Audiology for Young Children	2 PERIODS T-2, T-3 or Th-2, Th-3
317	Hilding	Physiology of Hearing: Relation to Hearing Loss	2 PERIODS T-1, T-2
318	Hinderer & Philpott	External Pyramid Reconstruction	2 PERIODS T-1, T-2
319 or 320	House	Surgery for Ear Diseases: Tympanoplasty	2 PERIODS T-2, T-3 or Th-2, Th-3
321	Kazanjian et al.	Traumatic Injuries of Face	2 PERIODS Th-1, Th-2
322 or 323	Lathrop et al.	Otological Office Problems	2 PERIODS T-1, T-2 or W-1, W-2
324	Lawrence	Sound Conduction in Middle Ear	2 PERIODS T-1, T-2
325	Lindsay	Deafness & Dizziness	2 PERIODS Th-1, Th-2
326 or 327	Mueller et al.	What the Otologist Should Know About Hearing Aids	2 PERIODS W-2, W-3 or Th-2, Th-3
328	Petrillo & Chessen	External Pyramid Reconstruction	2 PERIODS T-2, T-3
329	Reed et al.	Voice Therapy	2 PERIODS W-2, W-3
330	Riggs & Sputh	External Pyramid Reconstruction	2 PERIODS W-1, W-2
331	Saunders	Oropharyngeal Lesions	2 PERIODS T-1, T-2
332 or 333	Seltzer	A Typical Rhinoplasty	2 PERIODS W-1, W-2 or Th-1, Th-2
334	Semenov	Ear, Nose & Throat Therapeutics	2 PERIODS Th-1, Th-2
335	von Leden & Moore	Organic Voice Problems	2 PERIODS W-2, W-3
336 or 337	Walsh	What Can Be Done for Deafness	2 PERIODS T-1, T-2 or Th-1, Th-2
338 or 339	Work	Techniques in Wide Field Laryngectomy	2 PERIODS T-2, T-3 or W-2, W-3

SCHEDULE OF INDIVIDUAL COURSES — OTOLARYNGOLOGY — Tuesday

Key T-1 — 9:00 a.m. to 10:00 a.m.

Course No.	SPEAKER	SUBJECT
407	Boies	Neurological Disorders
409	Bradley	Sudden Deafness
421	Dolowitz	Adrenal Steroids as Anti-inflammatory Agents
427	Ferguson	Pediatric Bronchography
431	Gardner	Practical Voice Therapy
435	Goodhill	Personal Techniques in Stapes Mobilization
444	Harris	Nasal Polypi
448	Hilsinger	Vascular Headaches
449	Holinger & Johnston	Bronchoscopic Techniques
458	Kos	Stapedial Mobilization
459	Kraus	Adventures in Space: Otolaryngic Aspects
474	Morrison	Children's Injuries
484	Rabbett & Bellucci	Submucous Resection of the Nasal Septum
487	Ronis	Sinus Surgery
501	Suehs	Secretory Otitis Media
507	Van Alyea	Management of Sinusitis

Key T-2 — 10:15 a.m. to 11:15 a.m.

Course No.	SPEAKER	SUBJECT
419	Dickinson	Bone Grafts
428	Fowler	Facial Paralysis and Tics
443	Harkins	Office Management of Allergic Patients
453	Jordan	Nasal Fractures
471	McMahon	Treatment of Sinusitis
475	Myers	Surgery of Chronic Otitis Media
479	Ogura & Birenboim	Roentgenography of the Head and Neck
485	Reger	Practical Office Audiometry
488	Ryan	Headache
502	Tabb	Maxillectomy: Surgical Technique

Key T-3 — 11:30 a.m. to 12:30 p.m.

Course No.	SPEAKER	SUBJECT
401	Alexander	The Adenoid Problem
402	Altmann	Tympanoplasty
403	Anderson	Rhinoplasty: Practical Considerations
405	Becker	Plastic Surgery for Protruding Ears
414	Cody	Eustachian Tube
418	DeWeese	Problem of the Dizzy Patient
423	Erich	Fractures of Facial Bones
426	Feldman	Office Hearing Testing of Young Children
430	Furstenberg	Management of Nasal Obstruction
432	Glorig	The Otologist and the Noise Problem
438	Grandon	Pulsion Diverticulum of the Hypopharynx
445	Harvey	Roentgenograms of Sinuses, Mastoids, & Chest
454	Juers	Preservation of Hearing in Surgery
457	Kobrak	Treatment of Middle Ear Deafness
461	Lempert	Temporal Bone Surgery
464	Limarzi	Blood Disturbances
473	Missal	Skin Testing
476	Neivert	Surgery of Nasal Vault
489	Samter	Steroids in Otolaryngology
503	Tato	Tympanoplasty: Functional Examination

SCHEDULE OF INDIVIDUAL COURSES — OTOLARYNGOLOGY — Wednesday

Key W-1 — 9:00 a.m. to 10:00 a.m.

Course No.	SPEAKER	SUBJECT
404	Baker	Chronic Cough in Children
406	Bellucci	Surgery of Stapes & Oval Window
416	Dean	Practical Neuro-otolaryngology
420	Dixon	Lesions of the Oral Cavity
422	Dougherty	Adrenal Cortical Steroid Hormones
434	Goldman	Vasomotor Rhinitis
435	Goodhill	Personal Techniques in Stapes Mobilization
437	Graham & Dill	Advanced Audiologic Techniques
439	Guilford & Wright	Permeatal Otologic Surgery
446	Hilger	The Injured Malar Bone
448	Hilsinger	Vascular Headaches
451	House	Stapes Mobilization Procedure
458	Kos	Stapedial Mobilization
460	Lederer	Otolaryngologic Misadventures
471	McMahon	Treatment of Sinusitis
472	McNally	Labyrinthine Tests
474	Morrison	Children's Injuries
491	Sellers	Frontal Sinusitis: Acute & Chronic Infections
493	Shambaugh	Otosclerosis: Selection of Therapy
509	Williams	Surgical Exposure of Base of Nose, Maxillary Spine & Pyriform Aperture
510	Wynn	External Nasal Growths

Key W-2 — 10:15 a.m. to 11:15 a.m.

Course No.	SPEAKER	SUBJECT
415	Crispell	Allergy in Children
424	Farrior	Fenestration Operation
428	Fowler	Facial Paralysis and Tics
440	Hale	Voice Therapy
452	Jones	Allergic Rhinitis
456	Kemler	Bilateral Thyrotomy for Carcinoma of Larynx
462	Lepper	Antibiotics in Otolaryngology
463	Lewy	Direct Laryngoscopy
467	Lynch	Suspension Laryngoscopy
477	Norris	Partial Laryngectomy
482	Perlman	Fluid in the Middle Ear
486	Rinkel	Food Allergy
495	Simonton	Nasal Polyps
506	Tremble	Practical Therapeutics in Office Practice

Key W-3 — 11:30 a.m. to 12:30 p.m.

Course No.	SPEAKER	SUBJECT
410	Brodnitz	The Actor & Singer in ENT Practice
412	Canfield	Speech Audiometry
413	Clerf	Causes of Hoarseness
414	Cody	Eustachian Tube
418	DeWeese	Problem of the Dizzy Patient
423	Erich	Fractures of Facial Bones
431	Gardner	Practical Voice Therapy
438	Grandon	Pulsion Diverticulum of the Hypopharynx
441	Hallberg	Severe Nosebleed
442	Hampsey	Sinusitis in Children
455	Kastein	Disorders of Communication in Children
461	Lempert	Temporal Bone Surgery
465	Loch	Septum Deviations
466	Lubart	Complications in Rhinoplasty
469	McGovern	Facial Nerve Diseases
480	Pastore	Lump in the Throat
496	Skolnik	Electrodiagnosis of Diseases of Facial Nerve
497	Slaughter	Unilateral Tonsillectomy
504	Tato	Tympanoplasty

SCHEDULE OF INDIVIDUAL COURSES — OTOLARNGOLOGY — Thursday

Key Th-1 — 9:00 a.m. to 10:00 a.m.

Course No.	SPEAKER	SUBJECT
405	Becker	Plastic Surgery for Protruding Ears
406	Bellucci	Surgery of Stapes & Oval Window
407	Boies	Neurological Disorders
420	Dixon	Lesions of the Oral Cavity
434	Goldman	Vasomotor Rhinitis
437	Graham & Dill	Advanced Audiologic Techniques
441	Hallberg	Severe Nosebleed
447	Hilger	Acute Nasal Injuries
454	Juers	Preservation of Hearing in Surgery
460	Lederer	Otolaryngologic Misadventures
468	Maxwell	Tumors of the Parotid Glands
470	McLaurin	Treatment of External Otitis
472	McNally	Labyrinthine Tests
490	Sellers	Office Practice of Otolaryngology
505	Tato	External Frontal Sinus Surgery
508	Weaver	Tumors of the Face
510	Wynn	External Nasal Growths
511	Yon	Management of Recovery Room

Key Th-2 — 10:15 a.m. to 11:15 a.m.

Course No.	SPEAKER	SUBJECT
411	Brodnitz	Vocal Rehabilitation
415	Crispell	Allergy in Children
433	Glorig	Hearing Aid Selection
450	Holinger & Johnston	Pediatric Laryngology
477	Norris	Partial Laryngectomy
478	Ogura	Laryngectomy and Neck Dissection
481	Pearlman	ENT Complaints in Old Age
492	Senturia	Diseases of External Ear
495	Simonton	Nasal Polyps
499	Snitman & Loewy	Surgery of the Neck
500	Som	Hemilaryngectomy
506	Tremble	Practical Therapeutics in Office Practice
507	Van Alyea	Management of Sinusitis

Key Th-3 — 11:30 a.m. to 12:30 p.m.

Course No.	SPEAKER	SUBJECT
402	Altmann	Tympanoplasty
408	Bolotow	Recent Advances in Rhinoplasty
412	Canfield	Speech Audiometry
413	Clerf	Causes of Hoarseness
417	Derlacki	Conductive Deafness
425	Farrior	Practicing Practical Otology
430	Furstenberg	Management of Nasal Obstruction
436	Goodhill	Endotympanic Surgery
467	Lynch	Suspension Laryngoscopy
483	Proetz	Nasal Health & Air Conditioning
493	Shambaugh	Otosclerosis: Selection of Therapy
494	Simmons	Problem of the Bleeding Patient
498	Slaughter	Facial Fractures

SECTION ON INSTRUCTION

ADVANCE ORDER SHEET

All courses cost $2.00 for each period (one hour). Follow instructions explicitly and check for errors in listing before mailing.

Orders will not be accepted for presale after October 3. To ensure acceptance they should be mailed before September 30 to

WILLIAM L. BENEDICT, M.D., *Executive Secretary-Treasurer*
American Academy of Ophthalmology and Otolaryngology
15 Second Street S.W., Rochester, Minnesota

Academy Candidates and Guests May Purchase Tickets Only at Instruction Desk in Registration Foyer

(Over)

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- ☐ Tuesday
- ☐ Wednesday
- ☐ Thursday

Total Amount Enclosed $_____

SELECTION OF COURSES ON REVERSE SIDE OF THIS BLANK

RECAPITULATION OF GENERAL INSTRUCTIONS

1. Monday, Tuesday, Wednesday, and Thursday are represented by the letters M, T, W, Th. The first period in the morning is represented by figure 1, second period by figure 2 and third period by figure 3. The first period in the afternoon is represented by figure 4, second period by figure 5, and third period by figure 6. All courses in oto-laryngology and maxillofacial surgery are presented in the mornings. All courses in ophthalmology are presented in the afternoons.

2. Reservation of instruction tickets in advance of the meeting will be made ONLY for MEMBERS whose 1957 dues have been paid. Academy candidates and guests may make selection of courses ONLY at the General Registration Desk in Chicago.

3. Make check payable to W. L. Benedict, M.D.

4. Mail order promptly to ensure reservation of first choices. If necessary, an attempt will be made to rearrange schedule to include "first choices."

(Over)

SELECTION OF COURSES

PERIOD		FIRST CHOICE		SECOND CHOICE		THIRD CHOICE	
		Course No.	Lecturer	Course No.	Lecturer	Course No.	Lecturer
MON.	4						
P.M.	5						
	6						
TUES.	1						
A.M.	2						
	3						
P.M.	4						
	5						
	6						
WED.	1						
A.M.	2						
	3						
P.M.	4						
	5						
	6						
THURS.	1						
A.M.	2						
	3						
P.M.	4						
	5						
	6						

News - - - Notes

INTERNATIONAL ASSOCIATION FOR THE PREVENTION OF BLINDNESS

A congress of the International Association for the Prevention of Blindness will be held during the time of the XVIII International Congress of Ophthalmology which will be held in September 1958 in Brussels, Belgium. The secretary-general is J. P. Baillart, 47 rue de Bellechasse, Paris VII, France.

INTERNATIONAL ORGANIZATION AGAINST TRACHOMA

The International Organization Against Trachoma will hold a one-day meeting during the time of the XVIII International Congress of Ophthalmology, which will be held in September 1958 in Brussels, Belgium. The secretary-general is Jean Sedan, 94 rue Sylvabelle, Marseilles, France.

INTERNATIONAL VOICE CONFERENCE

At the International Voice Conference in Chicago, May 20-22, 1957, some forty distinguished laryngologists, physiologists, physicists and voice scientists from outstanding research centers in the United States, Europe, and Asia will appear on the program.

The specified days will be devoted to the following subjects:

Monday: Research on Physiology of Voice Production

Tuesday: Clinical Procedures in Diagnosis and Training

Wednesday: Relation of Hearing to Voice

Participation in the Conference will be by prior registration. Further information may be obtained from Dr. Hans von Leden, 30 North Michigan Ave., Chicago 2.

AMERICAN-KOREAN FOUNDATION

The American-Korean Foundation and the United States Army Medical Service have announced the discontinuation of their joint project of shipping medical books contributed by individual physicians, medical schools, hospitals, and state and local medical societies to Korea.

Books should not be sent to the Sharpe General Depot in California as in the past for facilities no longer exist for packing and transshipping to Korea.

In making the announcement, Howard A. Rusk, M.D., President, American Korean Foundation, said, "the response of physicians and medical groups throughout the country to our appeal for books for Korean medical schools has been so generous that further contributions are not needed." As a result of this program, Dr. Rusk stated, over 77 tons, valued at $76,000, of medical texts, references, and periodicals have been shipped to Korea for distribution to Korean medical schools.

AMERICAN OTOLOGICAL SOCIETY, INC.

The Ninetieth Annual Meeting of the American Otological Society, Inc., will be held at the Hotel Statler, Washington, D. C., May 4, 1957.

At the morning session the following program will be presented:

"Some Uses of Electronic Computers in the Study of the Auditory Nervous System," Walter A. Rosenblith

"Microelectrode Studies on the Auditory Nervous System," Robert Galambos

"Behavioral Studies of Auditory Discrimination," William D. Neff. Discussion by Jerzy E. Rose

"Adventures with the Stapes," Terence Cawthorne, London. Discussion by Stacy Guild.

SECTION ON OPHTHALMOLOGY
AMERICAN MEDICAL ASSOCIATION

PROGRAM

June 5-7, 1957; Park Sheraton Hotel, New York

WEDNESDAY MORNING, JUNE 5

Chairman's Address: *The Differential Diagnosis of Melanoma of the Uvea from Simulating Lesions*
A. B. REESE, New York

Address of Invited Foreign Guest: *The Differential Diagnosis of the Tapeto-Retinal Degenerations*
PROF. J. FRANCOIS, Ghent, Belgium

Ocular Involvement in Naevoxantho-Endothelioma: Report of Two Cases
FRANK W. NEWELL, Chicago
Discussion to be opened by T. E. SANDERS, St. Louis

Pars Plana Cysts
SAMUEL T. ADAMS, Montreal, Que., Canada
Discussion to be opened by HERBERT M. KATZIN, New York

Improvement in the Hypertensive Retinopathy of 109 Patients Following Combined Adrenal Resection and Sympathectomy
WILLIAM C. FRAYER, Philadelphia
Discussion to be opened by JOHN WENDLAND, Minneapolis

Malignant Melanoma of Uvei: Observations on Growth and Behavior, Enucleation Refused or Long Delayed
BANKS ANDERSON, Durham, N. C.
Discussion to be opened by LORENZ ZIMMERMAN, Washington, D. C.

Studies on Continuous Electrocardiography During Ocular Surgery
RALPH E. KIRSCH, PHILIP SAMET, and VICTOR KUGEL, Miami
Discussion to be opened by HAROLD F. FALLS, Ann Arbor, Mich.

THURSDAY MORNING, JUNE 6

EXECUTIVE SESSION

Address of Invited Foreign Guest: *Iridencleisis in Buphthalmia*
FRANK W. LAW, London, England

Evaluation of New Anticholinesterase Agents in Glaucoma
IRVING H. LEOPOLD, DAVID GOLD, and PAUL GOLD, Philadelphia
Discussion to be opened by H. SAUL SUGAR, Detroit

A Surgical Approach to Total Xerophthalmia Through Transplantation of the Parotid Duct
JAMES E. BENNETT and ARBY L. BAILEY, Cleveland
Discussion to be opened by TRYGVE GUNDERSEN, Boston

New Aspects of Ophthalmoneurologic Diagnosis
GOODWIN M. BREININ, New York
Discussion to be opened by FRANCIS HEED ADLER, Philadelphia

FRIDAY MORNING, JUNE 7

SYMPOSIUM: PROBLEMS IN CATARACT EXTRACTION

Five Years Experience with the Ridley Operation
WARREN S. REESE and TURGUT N. HAMDI, Philadelphia

Acrylic Lenses in the Anterior Chamber: Experimental Studies in Animals
J. H. KING, JR., and RAYMOND SKEEHAN, Washington, D. C.

Clinical Report on Three Cases of Postoperative Epithelial Downgrowth Treated by Curettage and Cautery with Seventy Per Cent Alcohol
JOHN C. LONG and GEORGE S. TYNER, Denver

Cataract Extraction and Aqueous Outflow
JAMES E. MILLER, G. RICHARD KESKEY, and BERNARD BECKER, St. Louis

Tonographic and Gonioscopic Studies Before and After Cataract Extraction
PEI-FEI LEE and ROBERT R. TROTTER, Boston

Contact Lenses in Aphakia
EVERETT L. GOAR, Houston, Texas

Comparison of the Peripheral Iridectomy Versus the Keyhole Iridectomy
DAVID S. JOHNSON and RALPH H. PINO, Detroit

Conservatism in the Treatment of Congenital Cataract
FRANK D. COSTENBADER, Washington, D. C.
Discussion to be opened by JOHN DUNNINGTON, New York; PETER KRONFELD, Chicago; JOHN McLEAN, New York; A. EDWARD MAUMENEE, Baltimore; DERRICK VAIL, Chicago

THE ASSOCIATION FOR RESEARCH IN OPHTHALMOLOGY, INC.
TWENTY-SIXTH ANNUAL MEETING
June 3-6, 1957; Tropical Room, Park Sheraton Hotel, New York

MONDAY, JUNE 3

MORNING

Effects of Tachistoscopic Training on Visual Functions in Myopic Patients
CONRAD BERENS, LOUIS J. GIRARD, GERALD FONDA, and SAUL B. SELLS

The Human Optic Papilla: A Demonstration of New Anatomical and Pathological Findings
J. REIMER WOLTER

Continuing Studies on the Association of Adenovirus Type 8 with Epidemic Keratoconjunctivitis
L. HANNA, E. JAWETZ, Y. MISTUI, PHILLIPS THYGESON, SAMUEL KIMURA, and A. NICHOLAS

Precipitating Antibodies to Toxoplasma: A Follow-up Study of Findings in the Blood and Aqueous Humor; G. RICHARD O'CONNOR

Factors Underlying the Development of the Ciliary Processes
ALFRED J. COULOMBRE and JANE L. COULOMBRE

The Effects of Maternal Hypoxia on Inheritance of Recessive Blindness in Mice
AELETA NICHOLS BARBER

Distribution of Radioactive Sulphite in the Developing Eye; GEORGE K. SMELSER AND VICTORIA OZANICS

Oxygen Studies in Retrolental Fibroplasia. VI. *The Effects of Concentration and Duration of Exposure to Oxygen on Experimental Ocular Lesions;* ARNALL PATZ

AFTERNOON

The Response Pathway from Photoreceptor to Nerve Cells in the Limulus Lateral Eye; LEO E. LIPETZ

Studies of Photoreceptor Structures; JEROME J. WOLKEN

Electromyography of Fusional Movements; FREDERICK C. BLODI AND MAURICE VAN ALLEN

Autonomic Innervation of Extraocular Eye Muscles; WALTER MITCHELL and GERHARD A. BRECHER

The Effect of Ultrasonic Radiation Upon the Rate of Absorption of Blood from the Vitreous
GILBERT BAUM

Ocular Effects of Systemic Siderosis; PAUL A. CIBIS, E. BROWN, and S. M. HONG

Cytochemical and Morphological Changes in Corneal Stromal Cells Following Wounding
VIRGINIA L. WEIMAR

Further Studies on the Viability of Frozen Corneas: As Determined in Tissue Culture
JERRY W. DRAHEIM, SAMUEL D. MCPHERSON, JR., VIRGINIA J. EVANS, and WILTON R. EARLE

Studies of Bruch's Membrane. I. *Results of Flow Studies Through a Bruch's Membrane-choroid Preparation;* WOOD LYDA, NILS ERIKSEN, and NARENDRA KRISHNA

TUESDAY AFTERNOON, JUNE 4

A Study of the Uptake of P^{32}, Zn^{65} and I^{131} by Experimental Malignant Melanoma
JAMES F. O'ROURKE, HUMPHREY PATTON, and ROBERT BRADLEY

Anterior Chamber Perfusion Studies. II. *Controlled Particle Size in Relationship to Pore Size*
PHILIP A. PETER, WOOD LYDA, and NARENDRA KRISHNA

A Study of the Innervation of the Chamber Angle. Part II. *The Origin of Trabecular Axons Revealed by Degeneration Studies.*
MONTE G. HOLLAND, LUDWIG VON SALLMANN, and ELEANOR M. COLLINS

The Effect of Succinylcholine on the Extraocular Striate Muscles and on the Intraocular Pressure
F. J. MACRI

On the Occurrence of Proteolytic Enzymes in Normal and Cataractous Lenses
E. ALBERT ZELLER and ANIMA DEVI

The Transcorneal Potential; ALBERT M. POTTS and ROBERT MODRELL

Incorporation of S^{35}-Inorganic Sulfate Into Mucopolysaccharides of Cornea
BERNARD WORTMAN and JACK L. STROMINGER

Friedenwald Memorial Lecture

WEDNESDAY AFTERNOON, JUNE 5

In Vivo Intralenticular Implantation of Various Dyes and Enzyme Inhibitors; ADOLPH W. VOGEL

In Vitro Lens Studies. II. *Production of Cataractous Changes;* MARGUERITE A. CONSTANT

Studies on the Crystalline Lens: VIII. *Ascorbic Acid and Mitotic Activity in Cultured Lenses*
V. EVERETT KINSEY

Studies on the Sulfhydryl Groups of Lens
LORENZO O. MEROLA and JIN H. KINOSHITA

BUSINESS MEETING

Studies on Protein and Protein Synthesis of the Lens in Galactose Cataract
ZACHARIAS DISCHE, JOSHUA YOULUS, and GINEVRA ZELMENIS

Insulin and the Lens; T. FARKAS and JOHN W. PATTERSON

Lens Proteins; JULES FRANCOIS

Lens Proteins; ROBERT A. RESNIK

THURSDAY AFTERNOON, JUNE 6

Solution of the Differential Equations Pertaining to Aqueous Humor Dynamics; SAMUEL I. ASKOVITZ

The Effects of Ganglionic Blocking Blood on Aqueous Flow in Normal and Glaucomatous Subjects
DAVID A. ROSEN

The Aqueous: Plasma Steady-state Ratios of Potassium and Sodium and the Influence of Diamox and Dibenamine Thereon
JOHN E. HARRIS, A. EUGENE CARLSON, LOUISE GRUBER, and GERTRUDE HOSKINSON

Studies on the Mode of Action of Pilocarpine on Aqueous Outflow. Correlation of Tonographic and Gonioscopic Data with Histologic Studies of the Trabecular Meshwork of Monkey Eyes
MILTON FLOCKS and H. CHRISTIAN ZWENG

Dynamics of Diamox Induced Bicarbonate Changes in Aqueous Humor of Rabbit Eye
HARRY GREEN, MAYER J. MANN, SAMUEL I. ASKOVITZ, and IRVING H. LEOPOLD

The Bicarbonate Concentration of Guinea Pig Aqueous Humor: Effect of Scurvy and of Acetazolamide
BERNARD BECKER

The Tritium Steady State of the Rabbit Eye; FRANK W. NEWELL

Proctor Medal Award

Annual Banquet, 7 p.m., Wednesday, June 5, in the Baroque Room, Belmont Plaza Hotel

The afternoon program is as follows:
President's Address by John R. Lindsay
"The Structures of the Stria Vascularis," Catherine A. Smith
"Experimental Obstruction of Venous Drainage and Arterial Supply of the Inner Ear," Henry B. Perlman and Robert S. Kimura
"The Meatonatrotomy — A Special Approach for Plastic Procedure; with Moving Picture Demonstration," Fritz Zollner, Freiburg

The medical profession is cordially invited to attend these scientific sessions.

FELLOWSHIPS IN OPHTHALMOLOGY

Six additional fellowships for residents in ophthalmology, to begin July 1, 1957, have been announced by the Guild of Prescription Opticians of America, Inc., through its president, Galen B. Kilburn, of Atlanta. Applications for these fellowships must be received by May 15, 1957.

Each fellowship is for a total of $1,800, payable in monthly stipends over the period of a three-year residency. The grants are limited to residencies at approved institutions where full three-year residencies are offered. Each grant is made for the entire three years, to begin the first year. Application forms and covering information are available by writing to FELLOWSHIPS, Guild of Prescription Opticians of America, Inc., 110 East 23rd Street, New York 10.

The six new fellowships being granted represent one for each of the six areas into which the United States and Canada have been divided upon the basis of a nearly equal number of eligible residencies in each area. The selection of the Resident Fellow is made by a committee of ophthalmologists in each area.

The Guild provides all fellowship funds as well as the program's cost of administration. Together with the six Guild fellowships awarded last year, this year's new fellowships will bring the total to twelve, and next year the program will reach the permanent level of eighteen fellowships.

WE HAVE MOVED

The Academy has moved into new quarters. Our new address is 15 Second Street S.W., Rochester, Minnesota.

MARYLAND

Prof. Alan C. Woods, of the Wilmer Institute, Baltimore, was a guest speaker at several Latin American medical schools during the month of February 1957.

Invited by the Escola Paulista de Medicina, Dr. Woods gave five lectures on uveitis in Sao Paulo, which were attended by a large number of ophthalmologists from all over Brazil.

In Montevideo, Dr. Woods was the guest of the Medical College of the University of Montevideo, and in Buenos Aires he was the guest of the Medical College of the University of Buenos Aires.

Dr. Woods also lectured in Santiago and in Lima, where he was the guest of the University of San Marcos de Lima.

MICHIGAN

The Department of Ophthalmology of Wayne University College of Medicine will give nine months' training in basic ophthalmology beginning September 9, 1957.

Six mornings a week are spent in lectures and laboratories. Each afternoon students are assigned to eye clinics of affiliated hospitals. A fundus clinic is held weekly; also, one on muscles.

Students are given 120 hours of training in physiologic optics, 122 hours in histology and pathology, 60 hours in biochemistry, 40 hours in neuro-anatomy, and so forth.

Tuition is $300. Brochures on the basic science course will be mailed upon request. For further information write to Dr. A. D. Ruedemann, Chairman, Department of Ophthalmology, 690 Mullett Street, Detroit 26.

NEW YORK

A refresher course in "Histopathology of the Eye" will be given at the New York Eye and Ear Infirmary May 13-18, 1957, from 2 to 6 p.m. daily. The fee is $100.00. This course will be conducted by Drs. Bernard A. Roberts and S. Lawrence Samuels of the Department of Ophthalmic Pathology, Dr. Brittain F. Payne, Director. The number of students is limited. Address Registrar, Mabel R. Stewart, 218 Second Ave., New York.

Dr. Gerald B. Kara, ophthalmic pathologist of the State University of New York, College of Medicine at New York City, will conduct a course in "Histopathology of the Eye," May 13-18, 1957. Further information may be obtained from Miss Margaret Cobberly, 1-32 Basic Sciences Bldg., 451 Clarkson Ave., Brooklyn 3. The telephone number is Ulster 6-2020, Extension 371.

Five courses in ophthalmology for specialists are being offered by the New York University Post-Graduate Medical School during the first half of the 1957-58 academic year. They are as follows:

Histopathology: A part-time course, Sept. 16-20, under the direction of Dr. A. Marvin Gillman

Surgery of the Eye: A full-time course, Oct. 28-Nov. 2, under the direction of Dr. Rudolf Aebli

Ophthalmoscopy: A part-time course Nov. 4-8, under the direction of Dr. George N. Wise

Surgery of the Cornea: A full-time course, Dec. 2-6, under the direction of Dr. Ramon Castroviejo

For further information concerning these and other courses offered by the Department of Ophthalmology during each academic year, apply to Office of the Associate Dean, New York University Post-Graduate Medical School, 550 First Ave., New York 16.

NORTH CAROLINA AND SOUTH CAROLINA

The annual joint meeting of the South Carolina Society of Ophthalmology and Otolaryngology and the North Carolina Eye, Ear, Nose, and Throat Society will be held in Hendersonville, North Carolina, Sept. 15-18, 1957. Headquarters will be the Skyland Hotel.

Guest ophthalmologists who will be on the program are Dr. E. A. Maumenee, Baltimore; Dr. P. G. Leinfelder, Iowa City, Iowa; and Dr. Alston Callahan, Birmingham, Ala.

Guest otolaryngologists will include Dr. Francis E. LeJeune, New Orleans, and Dr. J. W. McLaurin, Baton Rouge, La. A third otolaryngologist will be announced shortly.

OHIO

The next course in Orthoptic Training at the Ohio State University, Department

of Ophthalmology, will begin in September 1957. This is an intensive nine-month program, combining basic science and practical work. No fees are charged, but the student must maintain herself during the training period. Inquiries should be directed to Dr. William H. Havener, Department of Ophthalmology, Ohio State University, Columbus, Ohio.

PENNSYLVANIA

The Committee on Postgraduate Education of the Montefiore Hospital announces an "Advanced Course in Slit Lamp Biomicroscopy of the Living Eye," combined with additional courses in ocular gonioscopy, indirect ophthalmoscopy, surgery of intraocular foreign bodies, surgery of cataract, and retinal detachment surgery, to be presented by the Montefiore Department of Ophthalmology under the direction of Dr. Harvey E. Thorpe and associates. The course will be given at the Montefiore Hospital, Pittsburgh, for five days, May 6-10, 1957, from 8:00 a.m. to 4:00 p.m.

Guest speakers will be Dr. Robert Masters, Indianapolis, and Mr. Lee Allen, Iowa City, Iowa.

The fee for the course is $80.00. A deposit of $25.00 is required for registration. For further information write to A. McNabb, Secretary of Postgraduate Ophthalmic Courses, 206 Iroquois Bldg., Pittsburgh 13.

A large group of Philadelphia-area ophthalmologists attended a special program and open house to dedicate the new eye clinic of the Department of Ophthalmology, Temple University Medical Center, March 6.

One of the nation's leading specialists, Dr. Algernon B. Reese, chairman of the Section on Ophthalmology of the American Medical Association, addressed the meeting on surgery for the relief of cataract. Dr. Reese, an authority on eye surgery, is also clinical professor of Ophthalmology of the College of Physicians and Surgeons of Columbia University in New York.

Dr. Robert Robbins, professor of Radiology and director of the Radiotherapy Department at Temple University Medical Center, spoke on radiation of the eye.

Under the direction of Dr. Glen G. Gibson, professor and head of the Department of Ophthalmology, the clinic includes all the modern diagnostic instruments. Special operating room equipment for the performance of eye surgery also has been obtained for the operating room.

The Fifteenth Annual Meeting of the Pennsylvania Academy of Ophthalmology and Otolaryngology will be held May 23-25, at Bedford Springs Hotel, Bedford, Penn. Dr. Chevalier L. Jackson, Philadelphia, president of the organization, will preside. The guest of honor will be Dr. Edwin N. Broyles, Baltimore. The meeting will consist of study groups and general sessions. The faculty for the study groups will be members of the societies. Noted ophthalmologists and otolaryngologists have been invited to participate, and two symposiums will be presented: "The Doctor and Insurance" and "The Practical Management of the Child with a Hearing Problem."

CANADA

A most significant and generous contribution for research in the diseases of the eye has been given to the University of Toronto by Herbert G. Stapells, Q. C., a Toronto corporation lawyer. His donation of $25,000 will be used for clinical research by members of the staff of the Department of Ophthalmology in the University's teaching hospitals and also to defray expenses of staff members for short periods of study in other research centers.

The Department has received large support from government sources for its eye research program, but few private individuals have supported clinical eye research to such an extent.

WEST PAKISTAN

Roland I. Pritikan, M.D., of Rockford, Illinois, while at Shikarpur, West Pakistan, earlier this year, was named president of the Henry Holland Hospitals Alumni Association and of the Henry Holland Mission Hospitals Fund.

All alumni of the eye hospitals of Shikarpur and Khairpur Mirs are urged to remit an annual subscription of one dollar or more per year to the treasurer, Victor E. Lepisto, M.D., 238 Quincy St., Hancock, Mich.

Derrick Vail, M.D., is honorary chairman of the Board of Trustees of the Alumni and of the Fund.

POSITIONS AVAILABLE

OPHTHALMOLOGIST: Exceptional opportunity for an associate, leading to partnership in large practice in ophthalmology. For details write Walter Stevenson, M.D., 1124 Broadway, Quincy, Ill.

OPHTHALMOLOGIST: board-certified or eligible. Opportunity in fast-growing suburb of San Francisco. Rental suite available adjacent to well-established E. N. T. offices and optical dispenser. Write R. F. Marks, M.D., P. O. Box 517, Walnut Creek, Calif.

Board-certified or eligible OTOLARYNGOLOGIST, qualified in endoscopy, wanted to join clinic of five men, with expectation of becoming a full partner in the group. Practice limited to E.E.N.T. Write Morsman Clinic, 2011 Third Ave., East, Hibbing, Minn.

Medical office space is available in new one-story professional building in Two Rivers, Wisconsin, a city of 12,000 in East Central Wisconsin on Lake Michigan. It is an ideal location for an OPHTHALMOLOGIST. Other tenants in the building are a dentist and a law firm. For information write W. O. Simonis, D.D.S., Two Rivers, Wis.

OTOLARYNGOLOGIST wanted to associate with an older otolaryngologist in a seventeen-man specialty group (all members certified). Married man with basic training in head and neck surgery, bronchoesophagoscopy, and rhinoplasty desired. Circumstances make this an unusual opportunity. Write Louis W. Daley, M.D., Grove Hill Clinic, New Britain, Conn.

OPHTHALMOLOGIST wanted by large medical partnership in Southern California to complete a four-man department. Ample opportunity to do all phases of eye surgery. Opportunity for partnership; many favorable working conditions and benefits. Candidate must be Board-certified or eligible. Salary open. For detailed information write Carl Reiter, M.D., 1415 N. Vermont Avenue, Los Angeles, Calif.

OTOLARYNGOLOGIST wanted by large medical partnership in Southern California to complete a four-man department. Ample opportunity to do all phases of head and neck surgery. Opportunity for partnership in third year. Many favorable working conditions and benefits. Candidate must be Board-certified or eligible. Salary open. Write to Leonard S. Buck, M.D. 130 North La Cienega Blvd., Los Angeles, Calif.

Listings of positions available should be sent to W. L. Benedict, M.D., 15 Second St. S.W., Rochester, Minn., by the fifth of the month preceding publication. They should include (1) type of physician wanted (ophthalmologist or otolaryngologist; diplomate, resident, etc.); (2) type of position to be filled; and (3) whom to write for further information. Unless otherwise requested, listings will be published once only.

The Academy will handle no further correspondence beyond the listing and assume no responsibility. Neither does it endorse nor guarantee any of the published listings.

EMBRYOLOGY OF THE EYE

This motion picture has now been greatly reduced in price. By use of a new process of reproduction, prints of the film may now be purchased for $200.00 on one or two reels, including metal container and convenient fiber shipping case.

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MANUALS

	PRICE
RETINAL DETACHMENT, H. Arruga, et al.	$1.00
OCULAR SURGERY, Conrad Berens and Michel Loutfallah	1.00
CATARACT TYPES, F. C. Cordes	1.00
SLIT LAMP BIOMICROSCOPY, E. Goar, et al.	1.00
OUTLINE OF NEURO-OPHTHALMOLOGY, P. J. Leinfelder	1.00
DESCRIPTION OF THE ORBIT, McCotter, Fralick and Henderson	1.00
GLAUCOMA, Samuel J. Meyer	1.00
THE INTERPRETATION OF VISUAL FIELDS, C. W. Rucker	1.00
DISTURBANCES OF OCULAR MOTILITY, Richard G. Scobee	1.00
REFRACTION, Daniel Snydacker and Frank W. Newell	1.00
EXTRINSIC EYE MUSCLES, H. Saul Sugar	1.00
PRINCIPLES OF OTOLARYNGOLOGIC PLASTIC SURGERY, Oscar J. Becker	1.00
RADIOGRAPHIC ANATOMY OF THE TEMPORAL BONE, J. Brown Farrior	1.00
EXAMINATION OF THE LABYRINTH IN RELATION TO ITS PHYSIOLOGY AND NONSUPPURATIVE DISEASES, W. J. McNally and E. A. Stuart	1.00
NONSURGICAL COMPLICATIONS OF OTOLARYNGOLOGIC SURGERY, J. J. Pressman, et al.	1.00

MONOGRAPHS

HELPFUL HINTS FOR HANDLING THE HEARING HANDICAPPED, Gordon D. Hoople, et al.	$0.25
HEARING TESTS, Arthur L. Juers	0.25
PHYSIOLOGY OF THE LARYNX, J. J. Pressman and George Kelemen	.50
THE EMBRYOLOGY OF THE EAR, NOSE, AND THROAT, O. E. Van Alyea	0.25
STRABISMUS: A SYMPOSIUM, Kenneth C. Swan, et al.	0.50
REFRACTION DIFFICULTIES Clarence A. Veasey, Jr.	0.50

ABSTRACTS

Set contains outlines, briefs of instruction courses as presented at Academy meetings. Unbound.

Ophthalmology:	1954	$3.50
	1955	5.00
	1956	7.50
Otolaryngology:	1954	2.00
	1955	2.00
	1956	2.50

TRANSACTIONS

Subscription:	Per year, bimonthly publication	$10.00
Single issue:	Through 1950	0.50
	1951 through 1956	1.00
	1957	2.00

BOUND VOLUMES

Transactions:			
	Records of meetings held 1917 through 1949	Ea.	$1.50
	Vol. 55 (1951) through Vol. 60	Ea.	5.00
Tonometry—Tonography, Decennial Report (Bound)		Ea.	3.00

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